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A

VISIT TO NAHANT,

BEING A SEQUEL

OF THE

WONDERS OF THE DEEP.

BY A LADY.

NEW-YORK:

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A VISIT TO NAHANT;

A SEQUEL TO THE WONDERS OF THE DEEP.

BY A LADY.

Job 38: 16. "Hast thou entered into the springs of the sea? or hast thou walked in the search of the depth?"

CHAPTER I.

"The helm to his strong arm consigned,
Gave the reefed sail to meet the wind,
And on her altered way,
Fierce bounding, forward sprung the ship,
Like greyhound's starting from the slip,
To seize the flying prey.
Awaked before the rushing prow,
The mimic fires of ocean glow,
Those lightnings of the wave;
Wild sparkles crest the broken tides,
And flashing round the vessel's sides,
With shining lustre lave.
While far behind, their livid light,
To the dark billows of the night,
A gloomy splendor gave;

It seems as if old ocean shakes
From his dark brow the livid flakes,
In envious pageantry,
To match the meteor light that streaks
Grim Hecla's midnight sky."

On a bright afternoon in the summer of 1830, the steamboat C——t left the harbor of New-York for Providence, R. I., having her deck crowded with passengers. Some of these individuals were carried to the North by business, some went in the pursuit of health, while others still, were only actuated by a restless desire of change. Among the former class was a lady of the name of Stanley, with her son and two daughters, who were returning from New-York, to their residence in Massachusetts, from whence the mother had been summoned by business of importance. This had been satisfactorily arranged, and the youthful members of the family were animated with innocent joy, as they contemplated the pleasant journey which was before them; more particularly, as a sea-voyage was a novelty to them, for they had

made an inland journey from Boston to New-York.

At the hour of 4, P. M., the vessel was released from her hold on the wharf, and proceeded on her course, between the beautiful banks of the East river, which are studded with charming country seats, and pleasant villages. After a short time had elapsed, preparations were made for passing through Hurl-gate; this strait, however, no longer inspires the terror that it did in former days, and which is implied in its vulgar name, for the modern navigator has learned how to disarm it of its terrors, by passing it when the tide covers the formidable rocks.

When Mrs. Stanley pointed out to her children that part of the strait designated so long as the pot, or caldron, her son remarked, "This is certainly, dear mother, no longer an object of terror, but it interests me much because it is the first whirlpool I have ever seen; and while I watch the water which is eddying round so quickly, I think I can form a better idea of the formi-

dable Maelstrom on the coast of Norway, the accounts of which have so often filled my mind with terror."

"You *imagine* that you understand it better, Edward," replied his mother, "but the awful reality of that scene, is said to be inconceivable by those who have never witnessed it. The Maelstrom is one, among the many sublime spectacles which God has permitted to exist in our world, to show us what immense and resistless power He can impart to mere material objects when He wishes to do so. When we think of our entire helplessness, and inability to resist such a force as that imparted to the waters of the Maelstrom, or the torrent of Niagara, which force has been communicated by the Creator, should it not make us tremble, and fear exceedingly to provoke the wrath of that great and glorious God, when He shall come in all His majesty to judge the world?

"I remember reading an account of the tragical fate of a vessel which was unwarily drawn within the attractive power of the

current of which we have been speaking. There was another ship near, which had sailed in company—they were separated;—one of the crew of the vessel which was spared, when giving the detail, remarks, that their horror was extreme, when they saw, from a distance, the companions of their voyage drawn into the devouring Maelstrom: they beheld them in anguish as their sails went fluttering in the circling eddies of the whirlpool, whose power is beyond the resistance of human art; they saw them drawn nearer, and nearer, till finally they were entirely concealed in the distant horizon, and the unhappy crew went down amidst the dark vortex and awful moans of the Maelstrom. This awful spot seems to me a fit emblem of the dreadful abode, where the impenitent will be consigned to the 'blackness of darkness forever.' When we consider this solemn subject, let us pray, my beloved children, that we may all be kept from the bitter pains of eternal death. Look at those agitated waters, and remember that God's word declares the unrenew-

ed heart of man is like a troubled sea, whose waves cast up mire and dirt continually. Good bishop Leighton compares the heart of the Christian, and that of the sinner, to two wells of water, the latter of which has mud and dirt at the bottom. When nothing disturbs them, they may both appear calm and clear at the surface, but only let some temptation occur to stir up the water, and then the difference will be apparent; one, though agitated, will retain its beauty, while the other will become muddy and offensive."

The steamboat C——t at the time we refer to was sadly out of repair, and she labored along very slowly, causing great dissatisfaction to many of the passengers. The Stanley family, however, were not among the number, and as the twilight deepened into the darkness of evening, they were still to be seen on the deck, surrounding their mother, eagerly intent upon watching the beacon fires, as they were kindled one after another, in the numerous lighthouses that enliven the shores of Connecticut

Emma, the eldest daughter of Mrs. Stanley, expressed her regret that they should have no moon on that evening to add to the beauty of the scene. Her mother smiled, and replied, "I think it probable, Emma, that I shall find you, before long, congratulating yourself on the absence of the moon. You are incredulous; perhaps Edward can explain the reason why I anticipate pleasure from the darkness of the evening?"

He paused a few moments, and then declared that he could not imagine to what his mother referred.

"Do you not remember," said his mother, "one day last winter, reading to me from Stewart's Journal, an account of the luminous appearance which the sea-water presented, during his voyage in the Pacific, and a conversation which took place between us on that occasion? I told you then that I would, at some leisure moment, read to you a very satisfactory explanation of this phenomenon of the sea, which I had

met with in the travels of the Abbé Spallanzini."

"I now recollect the fact distinctly, mamma," replied Edward, "and we shall all of us be very happy to hear any thing farther from Spallanzini: at least, if it is as interesting as his history of the coral insect, and the coral fishery, which you related to us during our visit to the sea-shore."*

"At present," said his mother, "you must try to be contented with observing this phenomenon for yourselves, and you will then be better prepared to listen to the description of our friend the traveller."

The passengers of the C——t were at this moment summoned to the supper table, and when they returned to the deck, the darkness had very much increased, and the young Stanleys had an opportunity for gratifying their curiosity.

Their mother led them to the stern of the vessel, and as she did so, expressions of

* For this account of the labors of the coral worm, see "Wonders of the Deep," published by the P. E. S. S. Union, forming volume 50 of their library.

delight burst from their lips at the beauty of the scene. The deep blue of the heavens was studded with innumerable stars; and on turning their eyes from thence, to the dark expanse of water, through which the vessel was ploughing her way, they beheld the path she had lately traversed, marked by a track of fire: the foaming waves, which rushed from under the massy, revolving wheels of the C——t, were crested with light, and as the spray scattered its thousand tiny drops in every direction, they glowed like golden spangles in the sunbeams.

"Oh! mother," "dear mother," exclaimed Emma and Anna Stanley, as in their excitement of feeling they spoke both at once. "you were indeed right, this scene is more beautiful and gratifying than one by moonlight could have been, and we long to know what produces this extraordinary light."

"I can only tell you now, that it is supposed to be caused principally by those marine insects called medusæ, to some species of which the Calabrian seamen give the

expressive name of Candellivri di Mari, or Candles of the Sea."

"Can this be possible, mamma!" said Emma; "my patience will be indeed put to the test, till I can hear their history."

Much dissatisfaction was expressed by many of the passengers of the C——t, when the noise of hammers resounded through the vessel during the evening; and still increasing murmurs were heard, when it was discovered that the Captain considered it prudent to anchor during the night near the mouth of the Thames. Edward and his sisters, however, considered the suspension of their voyage, so far as they were concerned, a subject for congratulation, since it would enable them to enjoy the scenery by daylight. The vessel rolled much during the night, but this only disturbed for a short time the slumbers of the young travellers, and they returned before sunrise to the deck, with renewed life and spirits. The landscape before them was glowing with beauty; in front of the vessel lay "the glad waters of the dark blue

sea;" the huge waves were rolling their heavy masses of water towards them, as if to punish the presumption of those who had ventured to navigate its boundless surface; in the far horizon appeared Block Island, only distinguishable from the neighboring piles of fleecy clouds, by its remaining stationary; to the right, was discernible the dim outline of Montauk Point, as it bounded, with its streak of blue, the ocean to the southeast; while to the left extended the shores of Connecticut, with the two lighthouses which mark the sides of the Thames, as it empties its tribute of waters into the Sound, and at a little distance the picturesque group of islands, of which Fisher's is the largest; behind them, as far as the eye could reach, was to be seen the beautiful Sound, through which they had passed on the day previous. While Edward and his sisters were gazing in silent admiration on the lovely prospect, the sun peeped like a golden crescent from the bosom of the mighty deep, expanding each instant more and more, until his whole

disk appeared, throwing a rosy tint over the white crests of the waves, and coloring also the light and fleecy clouds. Before many hours had elapsed, the C——t was doubling Point Judith, and reeling to and fro in the formidable waves, which are almost always to be met with at that part of the coast. Soon after, she was navigating the beautiful waters of Narraganset Bay, and Providence river, and when night closed in, it found Mrs. Stanley and her children comfortably sheltered under the roof of her brother, Mr. Benson, who was an inhabitant of Boston, the justly celebrated capital of the North.

CHAPTER II.

" The floor is of sand, like the mountain drift,
And the pearl-shells spangle the flinty snow;
From coral rocks, the sea-plants lift
Their boughs where the tides and billows flow;
The water is calm and still below,
For the winds and waves are absent there;
And the sands are bright as the stars that glow
In the motionless fields of upper air;

There with its waving blade of green,
The sea-flag streams through the silent water,
And the crimson leaf of the dulse is seen
To blush like a banner bathed in slaughter."

When Mrs. Stanley arrived at the house of Mr. Benson, she found him preparing to remove to his pleasant cottage at Nahant during the hot months, and at his earnest request she and her children accompanied him there on a visit. After a short, but agreeable voyage, the travellers approached Nahant, and beheld that bold promontory rising from the fair bosom of the ocean, with its picturesque gray rocks, dotted with beautiful white villas, or pretty cottages, presenting a scene to delight the eyes of the painter or the poet.

Soon after their arrival the young Stanleys seated themselves on the rocks near their uncle's dwelling, and gazed with extreme interest on the charming prospect; the sky was of a deep melting blue, and the ocean reflected its beautiful coloring; numerous vessels were to be seen, some just spreading their broad sails to court the

breeze, which was to waft them from their native land, while others appeared like dark specks on the horizon. Multitudes of small fishing boats were also observable, one moment rising on the crest of the billow, and then apparently buried beneath the waves.

There is one beautiful peculiarity in the coast of New England, which is in vain sought for along the sandy beach of the middle and southern states, and which arises from the profusion of sea-weed that covers its rock-bound shore. This feature in the landscape of Nahant can only be seen in full perfection under a cloudless sky, and when the ocean is in a state of placidity. At such periods the remarkable transparency of the sea-water, enables the spectator to contemplate objects to a great depth below the surface, and as the rays of the sun shine through the clear expanse of water, they strike upon the rich covering of sea-weed which clothes the rocks, and reveal their beautifully varied tints, which are of-

ten to be seen vying with the most delicate productions of the flower garden.

Mr. Benson directed the attention of his young relatives to this point, and bade them mark the long, pliant branches of one species of the Fucus, or sea-weed, which were raised from their rocky bed by each advancing wave, like the tresses of hair on the head of a child as it sports in the breeze.

On their return to the house he exhibited to his guests a large collection of dried specimens of Fuci, or sea-weed. Many of them had been collected on the coast of New England, while others had been brought by him from distant regions. They were of various shapes and hues, some being of the most delicate rose color, others of a deep crimson or purple, while another class formed a beautiful gradation, from a delicate pea green to a dark green, or olive. He told them that he had "seen some species so minute as to require the aid of a microscope, while others were to be met with in the Southern Ocean growing to the

enormous length of several hundred feet. Many of the inhabitants of the islands in the Pacific, he informed them, made use of sea-weed as an article of nourishment, while in this country and in Europe it was employed in vast quantities as the article from which the useful soda is manufactured."

Among other species of sea-weed, Mr. Benson exhibited to Edward Stanley a specimen of the Fucus natans, which does not attach itself to the rocks, but vegetates in immense floating masses in the tropical seas, sometimes in such quantities as seriously to obstruct the course of vessels.

"I wish you, my dear children," observed Mr. Benson, "to notice the substance of the sea-weed, which is so unlike the vegetable productions of the land. Examine these plants which I have just plucked; you observe they are so leathery and tough that they will not break, in spite of my bending them." He then selected a dried specimen of the same species, which had lost all this leathery character, and had become very

brittle, and of a black color. "I informed you, Edward," he continued, "that the South Sea islanders make use of the sea-weed for food, and that we employ it in the manufacture of soda, but I had forgotten to tell you that it affords nourishment to innumerable quantities of marine worms, shell-fish, and fishes of various kinds, even to the enormous whale, the monarch of the deep. Thus you see, my dear children, another proof that the Creator of the universe has made nothing in vain; but has with infinite wisdom mutually suited the various parts of creation to each other, which is to my mind one of the most striking proofs of the existence of just such a God as the Bible describes."

In the course of the evening, during which the conversation turned on the various objects that had engaged their attention during the day, Edward mentioned the great transparency of the water, and asked his uncle whether he had observed it elsewhere.

In reply, Mr. Benson described the beau-

tiful appearances which are presented to the eyes of the sailor, as he navigates certain parts of the ocean. He exhibited a fine coralline specimen which he had brought from the West Indies, and which had arrested his attention as it lay many feet below the surface of the water. "One of his sailors," he said, "heard him admire it, and diving for it, severed it from the rocks as a compliment to him. Talking of this subject," he continued, "reminds me of some interesting remarks which I lately met with in Elliot's Letters from the North of Europe, and which Edward may read for our mutual gratification." Mr. Benson took down from his bookcase the volume referred to, and having found the passage, placed the book in Edward's hands, who read as follows. "There is perhaps nothing which strikes a northern traveller more, than the singular transparency of the waters: and the further he penetrates into the arctic regions, the more forcibly is his attention riveted to the fact. At a depth of 20 fathoms, or 120 feet. the whole surface

of the ground is exposed to view. Beds composed entirely of shells, sand lightly sprinkled with them, and submarine forests, present through the clear medium, new wonders to the unaccustomed eye. It is stated by Sir Capel de Brooke, and fully confirmed by my observations in Norway, that sometimes in the fiords of Norway, the sea is transparent to a depth of 400 or 500 feet; and that when a boat passes over subaqueous mountains, whose summits rise above that line, but whose bases are fixed in an unfathomable abyss, the illusion of the eye is so perfect, that one who has gradually, in tranquil progress over the surface, ascended wonderingly the rugged steep, shrinks back with horror as he crosses the highest point, under an impression that he is falling headlong down the precipice. The transparency of tropical water generally, as far as my experience goes, is not comparable to that of the sea in these northern latitudes: though an exception may be made in favor of some parts of the China seas, and a few isolated spots in the

Atlantic. Every one who has passed over the bank, known to sailors as the Saya de Malha, 10 degrees north of the Mauritius, must remember with pleasure the world of shells and corals which the translucid waters expose to view at a depth of 30 or 40 fathoms."

When Edward had closed the volume, he told his uncle that this description of the beauties of the ocean, had increased his desire to traverse its vast surface, and behold them for himself. "How much that is wonderful and admirable, dear uncle," he continued, "would be exhibited to us if we could be permitted to see the deep recesses of the sea!"

"Yes, my dear nephew, we should in deed see much to call forth our praise, though man in his pride of heart is prone to say, why all this profusion of ornaments, created only to be buried beneath the waves? Many a mournful tale would also be revealed, could we read the mysterious secrets of the deep, for of how many pious, brave, noble, and beautiful beings, has it not been the grave!

'Unseen, unsepulchred, but not unwept,
By lover, friend, relation, far away,
Long waiting their return to home and country,
And going down into their fathers' graves
With their gray hairs, or youthful locks in sorrow,
To meet no more till seas give up their dead;
Some too—ay, thousands—whom none living mourn'd,
None missed—waifs in the universe, the last
Lorn links of kindred chains forever sundered.'

"Never can this sad catalogue be accurately made out to mortal eyes, till 'that great day comes for which all other days were made,' when 'the sea shall yield up the dead that are in it, and death and hell also the dead which are in them,' and when we shall all 'be judged, every man according to his works.' Many awful deeds of wickedness will be discovered to have been perpetrated on the fair bosom of the ocean, which were indeed dexterously shrouded from the eyes of man, but which that day will prove to have been known and registered in heaven by Him who 'searches us out,' and knows us perfectly, even when on the wings of the morning we flee to the uttermost parts of the sea." Mr. Benson

here drew out his watch, remarking, that the hour for evening prayer had now arrived; and when his household were collected, they sang at his request the following verses of a Psalm, taken from the 139th of David.

"Thou, Lord, by strictest search hast known
My rising up and lying down;
My secret thoughts are known to thee,
Known long before conceived by me.

Thine eye my bed and path surveys,
My public haunts and private ways:
Thou knowest what 'tis my lips would vent,
My yet unuttered words' intent.

From thy all-seeing spirit, Lord,
What hiding-place does earth afford?
Oh! where can I thy influence shun,
Or whither from thy presence run?

If I the morning's wings could gain,
And fly beyond the western main;
E'en there, in earth's remotest land,
I still should find thy guiding hand!"

CHAPTER III.

"The insect that with feeble wing
Just floats along the summer ray;
The flowret that the breath of spring
Wakes into life for half a day;
The smallest mote, the slenderest hair,
All feel our common Father's care."

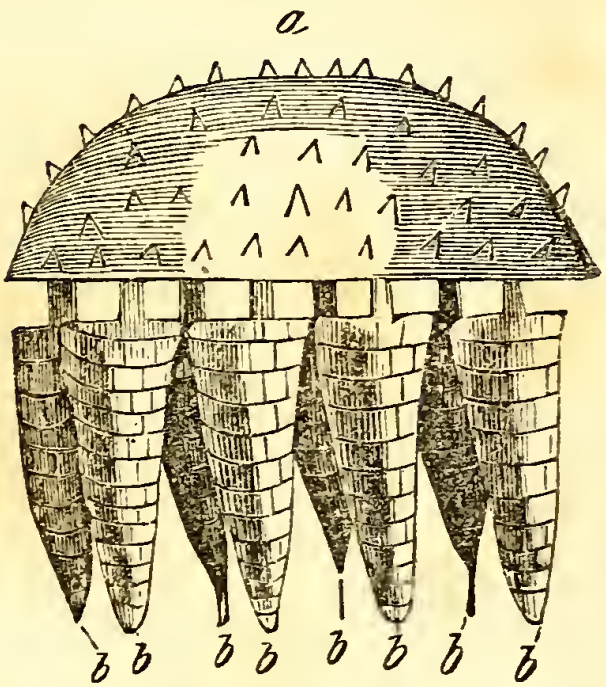
On the following morning Mr. Benson invited his guests to a walk on the long and narrow beach or ridge of sand which separates the promontory of Nahant from the main land; to which proposal the party gladly acceded. When they reached it, the young people advanced with rapid steps, for they were intent on discovering shells and other marine productions. Edward's eager steps were soon arrested, apparently by some very interesting object, which he was closely examining when his mother and uncle appeared. When he observed them, he exclaimed, "Dear uncle, can you tell me what this curious thing can be, which I found lying on the beach? To me it appears like a mass of jelly, shaped in the

form of a fungus, but Emma tells me that she saw something of the same kind when we were at the sea-shore, and when she showed it to our kind friend old Robert, she is certain he called it a sun-fish."

"Emma is correct in her opinion," replied Mr. Benson, "this thing which to your eyes, Edward, appears like a mass of jelly, is, or was once a living creature, belonging to the genus called, by Linnæus, Medusa. They have sometimes received the expressive name of sea-jellies, by others they are called sun-fish, or sea-nettles. This last name, I presume, is derived from the fact of their imparting a slight tingling and irritation to the flesh on handling them. I have seen these animals thrown wantonly into a pail of fresh cold water, which apparently caused them great suffering, for on such occasions the whole mass contracted, and expanded again convulsively: instead of the transparency exhibited while in health, they became opaque and full of white milky fibres."

"This Medusa, my dear children," said

A MEDUSA, GELATINE, OR JELLY-FISH.



a. The body of the animal.

b. b. b. The arms or tentacula.

Taken from Kirby's B. T.

Mrs. Stanley, "reminds me of the promise I made you during our voyage up the Sound, and which I have not forgotten."

"We did not think, dear mother," replied Anna, "that you had forgotten it, because you never, I believe, make us a promise without remembering to keep it; but we were saying this morning that we should be very happy to hear about the bright little worms of the sea, when you were at leisure to tell us."

"I have only waited that I might get time to clothe the traveller's ideas in somewhat more simple language than he made use of; to night, however, I shall be ready to gratify you."

When evening came the young Stanleys seated themselves around their beloved mother with more than common pleasure, because their anxiety was very great to hear what she had to tell them.

Mr. Benson also arranged himself in a comfortable position in his large chair, and smiled on his young relatives, as he told

them he too was going to be a boy again, and ask permission to hear a story.

"You no doubt recollect," said Mrs. Stanley, "my telling you that the sparkling appearance of the sea-water, which you admired so much during our voyage, was supposed to be principally caused by the presence of one particular family of marine animals. These were called Medusæ by Linnæus, and the name was adopted by following writers, until the celebrated Cuvier, and the disciples of his school, introduced them under other names, in their different classifications of the animal kingdom. Baron Cuvier ranged them as a group with some other genera, under his class of Zoophyte. Lamarch separates them from many of these, and enumerates them among his Radiaries, as forming a household by themselves, to which he gives the expressive name of *Gelatines*, or Sea-jellies. I will not perplex your minds, or burden your memories at present with these different systems, and will speak of them to you by their old-fashioned name of Me-

dusæ, since it is by this term you will find them recognized by Spallanzini, on whose account I shall depend in giving their history. As the Medusæ are in many respects such singular creatures, I shall describe one of them to you more particularly. I have not been able to find in any work that I have been able to consult, so clear a description of them as that furnished by Spallanzini of the species in which he was peculiarly interested. He says himself that he had never been able to meet with any 'but imperfect accounts of the life and habits of these curious animals.' No author that he had consulted ever mentioned their luminous appearance, excepting Linnæus, and he only in one passage, in which he asserts that some learned man had seen 'in the sea between Spain and America. Medusæ dispersed over the water when calm, and shining in the night like so many candles.' Our traveller had found different species of them in the sea of Genoa and in other places, which showed no brilliancy at night, but he was fully gratified when

he beheld those of Messina. The body of this species was shaped like the head of a fungus or mushroom, being convex or round above, and concave or hollow beneath; they vary in size from two to four inches across; round the edges they become thinner like the fungus, and have the appearance of being cut into a fine fringe; and where that is joined to the stalk, the Medusa had four long, round, hollow bodies, called Tentacula, or feelers,* of a large size, and eight smaller ones: these feelers all ran lengthwise, and adhered to the lower part of the animal, which answered to the under and hollow side of a fungus; the surface of the body was very smooth, and was covered with a slimy matter; at the highest point of the upper side was a large opening leading into a cavity, which looked like a jelly-like purse; at the bottom of

* "*Tentacula*, or feelers: organs supplying the place of hands and arms to the animal, intended both for feeling, and for seizing and holding food and other substances, and for conveying it to the mouth." See index to Ware's edition of Smellie's Philosophy of Natural History.

this were four small holes, by which the water passed out that entered in at the large opening, which Spallanzini supposed was the mouth of the animal. Tell me whether either of you can form a conjecture as to the use of the purse?"

Emma and Anna were silent, and looked to Edward as if they expected him to speak. After a few moments of thought, he answered, "This Medusa was so unlike common animals, dear mother, that I hardly know what to say. If it was a living creature, however, it must have found nourishment of some kind, though I am sure I cannot imagine what sort of food would have been suitable, or delicate enough for such a jelly-like gentleman. If he ate, he must, I suppose, have had a stomach, and I cannot think where that could have been unless this purse was it."

"You are right in your conjecture, Edward," replied his mother, "this cavity or purse was in reality the stomach of the Medusa. With respect to the kind of food on which it depended for sustenance, Spallan-

zini was inclined to think that it lived on small fish and marine worms, as he once found a Medusa with a little fish tightly grasped in its feelers, and the seamen of Messina informed him that such a sight was by no means uncommon. He farther informs us that the substance of these animals was so tender that it could be cut with a thread, and was at the same time as transparent as glass. Throughout the greatest part of it, even when examined with a microscope, no vessels or fibres could be perceived like those of other creatures, except at the top of the purse, or stomach, where he found four small bunches of long, thin bodies twisted together, resembling in some respects the intestines of other animals."

At this part of the narrative Mrs. Stanley paused for a few moments, and Emma took advantage of the opportunity to inquire eagerly, how the Medusa moved through the sea.

Her mother answered, "They have neither hands nor feet, Emma, and yet they

contrive to travel from place to place. They are proved to be animals principally by their possessing powers of motion, and these depend almost entirely on their ability to enlarge and contract the outer part of the body. The traveller tells us that from a boat he watched the motions of a swimming Medusa: he perceived that it turned the round part of its body towards the surface of the water in a slanting direction, and that the fringed edges occupied the space behind. Every few minutes it drew in the latter, and then swelled them out again. As the animal is always below the surface of the water, it will of course have its open mouth and stomach full of it. As it draws in its body the water is pressed out of the four holes that I have mentioned, and thus forced against the edges: this gives it an impulse, which is sufficient to make it proceed onward, while at the same time all its twelve *feelers* are stretched beyond the edges of the body like feet."

Mrs. Stanley here closed her papers, saying at the same time, "I have taken so long,

brother, to describe the appearance of the Medusa, that I think I had better defer the account of the light it exhibits until another time." Mr. Benson assented, telling her as he did so, that it was not because he felt no inclination to hear what she had to say, but because he was afraid they might be detained until too late an hour.

"I have been more particular, brother," she said, "in this part of my narrative, because I wish my children to mark the skill which has been shown in the formation of this curious creature, which is ranked among the lowest orders of animals. From what you told them of the sufferings inflicted on the Medusæ by throwing them in cold fresh water, they will see that they were created expressly to inhabit salt water. When we think of all these things, can we hesitate, my dear children, to say that the Being who formed them was full of mercy and consideration for the comfort of his creatures, even the most feeble? And when we see Him exercising so much thought, in always remembering to place

the poor little Medusæ exactly in the element suited to them, let us be comforted and strengthened in our belief, that if we are among his people he will be sure to cast our lot exactly in the circumstances which are best suited for us. Our blessed Redeemer bids us look at the little sparrow, and observe how well they are taken care of, in order that we may learn to trust our heavenly Father entirely. We 'are of more value,' He assures, 'than many sparrows,' and yet not even 'one of them falls to the ground' without God's notice."

CHAPTER IV.

"With scarce inferior lustre gleamed the sea,
Whose waves were spangled with phosphoric fire,
As though the lightnings there had spent their shafts,
And left the fragments glittering on the field."

"How very glad I am the sun has set, mother," said Emma Stanley, as she watched it anxiously from her uncle's piazza on the following evening.

"Why are you so much pleased, my

dear? have you spent the day in such a manner, that you have no stings of conscience in looking back upon it?"

Emma blushed, for she remembered that her mother had been obliged during that day to reprove her seriously several times. "I did not indeed think so, dear mother, for no day passes that I don't do something naughty. It seems to me that if I try with all my might, I am sure to do wrong a great deal oftener than Anna or brother;" and while she spoke the tears of contrition stood in her eyes.

Her mother stroked her forehead tenderly, and replied, "You know, my daughter, I often tell you that if you only strive in your own might you will be sure to fail. You know well where you must go for strength. I suppose your pleasure at the sight of the setting sun, arose from the thought that you would soon be gratified by hearing more of the Medusæ of Messina. But in your desire after promised enjoyments, you should not forget that we shall have to give an account on the great day,

of each waking hour as it passes along, and therefore it is wrong to wish to hurry over any of them."

While Mrs. Stanley and her daughter were thus engaged in conversation of a religious kind, Mr. Benson tapped at the parlor window to summon them in. They immediately rose and walked into the house, where they found the table arranged with lights for them.

"You see, sister," said Mr. Benson, "I am almost as impatient as your children, to hear the sequel of the history of the Medusæ."

"And I am quite ready to gratify your wishes," she replied, and producing her notes, she continued as follows. "I think I cannot better introduce this part of my subject than in the following words of the traveller. 'If in the beginning of the evening we enter the strait of Messina in a low boat or bark, coasting near the land where the water is perfectly calm, the Medusæ, which are usually very numerous there, begin to shine with a light, which acquires

intensity and extent as the darkness increases; every Medusa resembling a bright torch, that may be seen for some paces round; on approaching, the brilliant phosphorus shows the form of the body. This light, when the evening twilight is distinct, is of a lively white, which strikes the eye when the animal is 35 feet below the surface.'"

Mrs. Stanley stopped for a few moments and looked at Emma, as if she expected her to speak; at last she said, "If any thing that I have said puzzles you, my dear, do not be afraid to speak."

"I would like, dear mother," she replied, "to know what you mean by the phosphorus of the Medusæ; last evening I heard one of the gentlemen who were here speak of the phosphorus of the fire-fly."

"I expected an inquiry on this point, and you know I am always ready to gratify you when you ask me at proper times. I am pleased that you did not do so last evening when strangers were present, because on such occasions I always wish young

persons to keep in the background, and not trespass upon the patience of others. When we speak of the phosphorescence of animals, we mean the property which those bodies possess of giving light without burning. A great many minerals have this power, some in an astonishing degree: thus if a piece of lime is placed on charcoal before the compound blow-pipe of a chemist, it will emit a light of so brilliant a kind that it can scarcely be looked at. Putrid fish often exhibit a great degree of phosphorescence, and so does a certain kind of light decayed wood, which you have often amused yourselves in playing with, and called lightning-wood. 'Phosphorus is a simple substance,' to use the words of a popular writer,* 'that was formerly unknown. It is found in all animal substances, and is now chiefly obtained from the powder of burnt bones by chemists.' It is so combustible that it will take fire from the heat of the fingers, and if a small piece

* "Conversations on Chemistry."

of phosphorus is cut off and put in a glass receiver of a chemist, it may be set on fire by merely touching it with a piece of red hot iron wire, when the most brilliant blaze will be produced. We will now return to Spallanzini and his observations on the Medusæ of Messina. He observed, there would be in them sometimes a display of light for half an hour or more, and then again it would disappear, and not be visible until after a long interval. These interruptions led him to think whether the brilliancy might not depend in a considerable degree on their being kept in motion. And he was strengthened in this belief, by his recollection of the fire-fly, which never, you know, shows any light when in a state of perfect rest."

When Mrs. Stanley ceased speaking, Anna remarked, "I have been trying, mamma, to think how this gentleman was able to examine the Medusæ so well, since you told us they would not live in fresh water, and also, that the phosphorus could only be seen in a dark place."

"Do you not remember, Anna," said her brother, "how nicely Spallanzini managed to watch the coral worms when at work. I dare say he found out some way quite as clever to examine these animals."

"He acknowledges," said Mrs. Stanley, "that he found great difficulty in ascertaining the true history of the Medusæ. But he finally succeeded, and in the following manner: 'he applied himself,' he says, 'to examine these animals, by placing a number of them in vessels filled with sea-water, in which situation they would remain alive for several days, provided the water was changed frequently, and care was taken at the same time to have the vessels large.' Under such circumstances he found that the light was very little inferior to that which the animals possessed at sea: so long as their tremulous motion continued the light appeared, though he uniformly found it more striking when they were contracting, than when they were expanding."

"That accounts, mamma," said Edward,

"for the light changing so much in the sea: you told us that it was by swelling themselves out, and then drawing in again, that they were able to move through the water, and if the light was always greater when they were enlarging themselves, of course, it would be altering constantly. I suppose, of course, the Medusæ which were so bright in the Sound moved very much like those of Messina, though they were not near as large."

"I suppose there was a good deal of similarity in their movements, Edward, for we generally find that animals which belong to the same genus or family, are formed with like habits of almost every kind."

"How very much, mamma, I should love to have a few of the Messina Medusæ to watch," said Anna, "now that you have told us about them."

"As that is a pleasure which is out of your power to enjoy, my dear," replied her mother, "you must not covet it too anxiously. The Bible rule is the best rule for duty and happiness on all occasions, and

its words are very positive upon the point of covetousness. 'Be content with such things as ye have.' You cannot indeed examine these animals for yourself, but you can listen to the account of one who was far better able to do so."

"I want to ask one question," observed Edward, "and this is, whether there was any brilliancy about the Medusæ when they were quite at rest?"

"The traveller tells us," said his mother, "that at such times the light was so faint, that a careless observer would have supposed that it had ceased. I will here give you in his own language, some interesting facts with regard to his night vigils in the cause of science. 'In the chamber in which I slept at Messina, I had kept for several days a number of Medusæ in buckets filled with sea-water. The water in one of these was through neglect unchanged, and consequently the animals it contained suffered greatly, and no longer exhibited any tremulous motion when I returned to them soon after sun-set. The light too no longer ap-

peared, except when by handling them they were made to move for a short time. During the successive hours of that night I remained in the same chamber, sitting at a table to note down the observations I had made in the course of the day, and during that time having twice cast my eyes at the bucket, I found it entirely dark, though the candle had been removed into another room. But rising before day, I approached the bucket, which stood in one corner of the room, and perceived that the dying Medusæ still emitted a pale, but decided light. It was easy to repeat the experiment on others, and such repetitions were of importance, for the results were uniformly the same. I found likewise that these creatures do not entirely cease to shine until they are dead, and have begun to putrefy. I therefore concluded that the phosphorescence of these animals cannot properly be said to be interrupted; but that while in motion it is stronger and more lively, though a feeble light still continues in the intervals of rest, but at times so weak that

it cannot be discerned, unless the eye be cleared of the impressions of light from surrounding objects, as was mine, when after having slept in a dark room, I proceeded to make observations of this kind.'"

At this point Mrs. Stanley remained silent, to give her children an opportunity for making inquiries with regard to any thing which might have perplexed their minds.

After a pause of a few moments Edward inquired whether the traveller described the appearance which the animals presented when out of water, remarking, that his curiosity was excited to know whether in such a situation they would show any light.

"I am happy," said his mother, "in being able to state some singular facts observed by Spallanzini, with regard to the very point to which you allude. A Medusa having been left by him for twenty-two hours on a sheet of white paper, had ceased to live; the greater part of it was dissolved into a liquor, and every luminous trace had

vanished. A large glass of well-water was standing on the table, and he, without having any particular object in view, chanced to throw the remnants of the Medusa from the paper into the jar; it immediately sank to the bottom, and there remained motionless; but to his astonishment instantly shone with so bright a light that he was able to read by it print of tolerably large size. The water at the same time became luminous, and when he placed his finger in the glass it became plainly discernible. Supposing that the light would be increased if sea-water was used, he threw out the well-water, and filled the jar with sea-water; but the result disappointed him, as darkness followed. Subsequently he poured off the water from the ocean, and substituted that from the well, when a beautiful light again appeared."

"This was very extraordinary, mamma," said Emma, "but, of course, Spallanzini could explain it."

"With all his genius and ingenuity he was baffled, and acknowledges himself

wholly unable to assign a reason for this extraordinary fact, as well as another of the same kind, which occurred during his visit. When we behold a man of his talents and attainments, thus obliged to confess his inability to solve a simple phenomenon of nature, it should teach us all humility. It should make us feel the infinite distance which subsists between men of the strongest minds, and who have made the greatest acquisitions in human science, and the great God of the universe. The word of God assures us that our Lord 'knew what was in man; and needeth not that any should testify of him.' He knows too all the secrets of nature; He constructed the whole universe, and is perfectly acquainted with the vast system of machinery which He has put in operation. Ever since the creation men have been puzzling themselves to try and ascertain what the principle of life is, but in vain. Man finds it every where, and often wantonly destroys it, but when once extinguished, where is the human being so mighty, so highly gift-

ed, as to be able to restore it even to the most diminutive insect."

"Will you be so kind, dear mother," asked Anna, "as to tell us what other wonderful things those were which the traveller observed at Messina, besides those you have already related to us."

"Certainly, my dear," said her mother, "if you wish to hear the narration; I thought you might possibly be a little weary of the subject."

When Mrs. Stanley received the assurances of her brother and children, that they felt no decrease of interest, she again opened her manuscript, and read as follows. "Another Medusa which was dead, and had not been luminous for some time, was lying out of the water in the window of my chamber. During the night a slight rain fell, and every drop which touched the Medusa was changed into a brilliant spangle, till in a short time it was studded all over with such shining points. I could produce no such effect by sprinkling with sea-water in imitation of rain."

Mrs. Stanley here remarked, "In Spallanzini's eager desire to ascertain facts which advance the cause of science, he tried experiments on these poor Medusæ, which I certainly would not wish you to suppose that I approve of, or would imitate. So far as we can gather information with respect to God's creatures, by observing them as closely as we can without inflicting pain, I consider it not only innocent and interesting, but profitable to us, as intelligent beings, and as Christians to do so, since it leads us to more adoring views of Him 'who lives, and moves, and breathes in all.' But I cannot reconcile it to my conscience wantonly to deprive the unoffending creatures whom God has made, of life, for my own gratification, or unnecessarily to distress them. On this account, therefore, I shall pass over the account of such experiments made on the innocent Medusæ."

"I do not wonder, mamma," said Emma, "that the seamen of Messina should call these bright little creatures 'the Candles of the Sea,' for they seem to deserve the name

very well, since their light enabled the traveller to read in a dark room."

"I was reading an account, sister," observed Mr. Benson, "not long since of the beautiful appearance which the waters of Venice present at night, arising, the writer said, from the presence of the marine glow-worm in great quantities. Does your traveller make any allusion to this locality, for I am inclined to think the marine glow-worm of my author is the same with the Candellieri di Mari of yours ?"

"Spallanzini mentions these 'glow worms of the sea,' brother," replied Mrs. Stanley, "but considers them as a different animal from the 'Candles of the Sea,' and I will read you a few lines of his on the subject, to convince you of the distinction between them. He says, 'in my voyage from Lipari to Messina I was three times obliged to pass the night on the water. The sea was shallow, and the bottom abounded with sea-weed. In the darkness of the night these plants shone with sudden bright flashes, which became more numerous

when I moved them with the end of the oar, and induced me to suppose they contained marine glow-worms. Having drawn up some tufts of them from the bottom, I found these animals attached to them: and this convinced me that they were the cause of the luminous appearance there, as well as in the Venetian Lagune. That I might examine them more accurately, I carried them with me to Messina and Lipari in vessels of sea-water. When I arrived there, and was in a dark room, I detached the glow-worms from the sea-weed, either by taking them off gently with my fingers, as their light showed me the precise spot where they were, or by shaking the leaves of the plant in the water, first placing a cloth at the bottom of the vessel. They were heavier than the sea-water, and fell to the bottom, and the cloth then appeared studded with brilliant points, which were the animals I wished to detach, and which I ascertained to be the shining Nereis.' "

Mrs. Stanley received the thanks of the whole party for her narrative; for her

brother declared he had been equally interested with the young Stanleys.

"I must make a request in my turn," said the lady, "which is, that Edward or his sisters will endeavor to draw a moral lesson from the subject of our conversation this evening."

A long silence ensued, which Anna was the first to break, by saying timidly, "Dear mother, I cannot think so well as brother, but may I tell you some lines that have been in my mind all the while you have been talking of these beautiful Medusæ. You will not think a child presumptuous, mamma, in just altering a *little*, part of one of your favorite hymns.

'The spacious firmament on high,
With all the blue ethereal sky,
And spangled *sea*, a shining frame,
Their great Original proclaim.
In reason's ear they all rejoice,
And utter forth a glorious voice,
Forever singing as they shine,
The hand that made us is divine.'"

As Mr. Benson and his sister watched the glowing cheek of Anna, and listened to the

tremulous tones in which she gave utterance to her feelings in the language of the hymn, they were assured there was no intention on her part to make *any exhibition of sentiment*, and therefore they rewarded the little girl by an approving smile, which effectually dispelled her agitation.

"I am waiting, Edward, very patiently for your commentary," said Mr. Benson.

"I was thinking, uncle, that real Christians were like the Medusæ, shedding bright light around them wherever they moved, and that sometimes their example was brighter, and more useful to others after death, than when alive and full of strength."

"Yes, my son," said Mrs. Stanley, "that is indeed often the case; and by the blessing of God, (without which no human efforts can be of any avail in the work of salvation,) the beautiful light of a holy example made known to others after the death of the individual, may be the means of leading them to the reading of God's word, by which the darkness of unbelief is dispelled, and souls once dead in sin, are

enlightened by the Holy Spirit, and 'through the grave and gate of death, are made to pass to a joyful resurrection, for his merits who died, and was buried, and rose again for us.'"

CHAPTER V.

"They that go down to the sea in ships, that do business in great waters; these see the works of the Lord, and his wonders in the deep. For He commandeth, and raiseth the stormy wind, which lifteth up the waves thereof." Psalm 107.

In the early part of his life, Mr. Benson had made many sea voyages, and having an observing mind, his memory was stored with incidents connected with such scenes, and while he was relating them for the amusement or instruction of his nephew and nieces, the time appeared to them to pass by most swiftly. One afternoon they were seated together in their uncle's parlor, the windows of which commanded a fine view of the ocean: the sky had been dark and lowering all day, and the dense

masses of black clouds, which seemed piled one over the other, portended a terrible storm. Numerous fishing boats were to be seen with their sails spread, hurrying towards land as if the occupants dreaded to remain on the ocean, during the strife of the elements that was approaching: the sea fowl, apprized of the impending danger, by the instinct which their kind Creator has imparted to them, were scudding quickly along the brink of the waves to seek shelter in some retired cove; while the wind moaned in long and melancholy notes, and seemed to say it mourned at the devastation it was bringing over nature, at the commands of Him who bringeth "the winds out of His treasures," and who mercifully overrules all such events for the final good of his creatures.

Mr. Benson for some time observed the heavens with a most watchful eye, when, at length, starting up, he exclaimed quickly, at the same time pointing with his hand towards a certain part of the horizon, "Look yonder, Edward! were I at sea, I

should say that appearance was indicative of a water-spout."

"A water-spout, dear uncle!" exclaimed the young people all at once, "and have you ever seen a water-spout? Please to tell us something about it."

"I have seen them more than once, and shall not readily forget my feelings of awe at such times, and the breathless suspense with which I watched their progress. I have been in many situations of peril both at land and sea, but I can assure you, Edward, I never felt such sensations as when I have seen a water-spout approaching. This is not a time for me to give you an account of this phenomenon, for the tempest which is approaching would drown my feeble voice, but when it abates I will try to gratify you."

The young Stanleys had been early accustomed by their excellent mother to accommodate their wishes to those of others, and when they found their uncle preferred deferring to another time the relation of the narrative which they were anxious to hear,

they did not look sullen or displeased, but cheerfully acquiesced. Soon the storm burst with violence upon them; the thunder roared with deep and solemn sound, and the forked lightning played up and down the heavens with fearful brilliancy, but the party at the cottage exhibited no weak or childish fears. Their mother had endeavored from their earliest years, to impress upon their hearts a lively faith in the watchful care of God extended over them at all times. In their morning devotions they were accustomed to pray for God's protection through the day, and to praise Him for having kept them safely through the defenceless hours of the night; and before they retired to rest in the evening similar devotions occupied them. Thus, while they were solemn and silent during the raging of this storm, they were not frightened, for they knew it was their

"God who rules on high,
And thunders when he please,
That rides upon the stormy sky,
And manages the seas."

Night closed in, and found them engaged in watching the huge waves as they broke upon the rocks, one moment covering them with white foam, and the next, exhibiting their dark and ragged surface. Gradually the storm subsided, like a sullen child who is overpowered by superior force, but not subdued into good humor.

When the family assembled round the table in the evening, the young Stanleys waited in silence to know whether their uncle would remember his promise about the water-spout. They were anxious to hear it, but they did not think it proper for them to remind him of it.

At length Mr. Benson broke the silence by observing, "Edward, what do you suppose are the causes which produce water-spouts?"

Edward modestly replied, "I have always supposed, uncle, that they were brought on by very much the same circumstances as those which on land produce whirlwinds."

"I believe your idea is correct, Edward," replied Mr. Benson, "and it would be diffi-

cult to decide which is the more appalling sight of the two. These phenomena are more common in the southern than in the northern hemisphere, though from what cause I am ignorant. On one occasion while on a voyage in the Pacific, I had an opportunity of seeing a water-spout in perfection. When our attention was first turned to it, we observed an appearance at a certain spot at some distance from us, as if the ocean was boiling violently; above this rested a cloud of smoke, something like the steam you have seen hanging over a boiling pot; accompanying this was a loud noise like the rushing of a torrent of water; this noise was associated with another, which I can compare to nothing but the hissing sound which you have noticed, when the engineer of a steamboat first attempts to check the steam, when his vessel is about to land passengers: almost immediately after the sound reached our ears, we perceived a column of steam arising with amazing velocity towards the heavens, apparently not thicker than a man's arm,

and through the steam we all thought we could see water rising upwards in a spiral manner; this continued for the space of from ten to twenty minutes; then another rose; finally, a third: they approached our vessel, while our crew remained almost breathless with dismay, for we should probably have been destroyed had we come in contact: finally, they passed on, and the hearts of all of us, even the most thoughtless, were lifted up in praise to Him who had preserved us from so dreadful a fate." "Dear uncle! were you not very much frightened by these awful water-spouts?" inquired Anna. "Not exactly *frightened*, Anna, but my mind was in a most solemn state, as I gazed at this phenomenon of the sea, and realized that I might possibly be on the verge of eternity." "Do you remember, brother," inquired Mrs. Stanley, "the fine description of a similar scene to that you have related, given in the Rev. Mr. Ellis's Polynesian Researches?"

"I do," said Mr. Benson, "and I can assure you that I listened to it with feelings

of peculiar interest, and should have no objection to hearing it again, if Edward feels disposed to read it."

Edward gladly assented, and taking the volume from his mother's hands, (who had brought it into the parlor in anticipation of the conversation of the evening,) he read the following passages, which she had marked out.

"Early in 1819 circumstances rendered it desirable for us to visit Raiatea, (one of the Society Islands.) About 9 o'clock in the morning Mr. Barff and myself, accompanied by five natives and an English sailor, embarked for Huahine. Though the settlements were about thirty miles apart, yet as the width of the channel was not much more than twenty miles, the mountains and coast of the opposite island were distinctly visible. The wind being fair, we expected to reach the Raiatean shore in three or four hours, and to arrive at the residence of our friends long before the close of the day. We had not, however, been an hour at sea when the heavens began to gather

blackness, and lowering clouds intercepted our view of the shore we had left, and of that to which we were bound. The wind became unsteady and boisterous, the sea rose, not in long, heavy billows, but in short, cross, and broken waves. We had no compass on board. The dark and heavy atmosphere obscuring the sun prevented our discerning the land, and rendered us unconscious of the direction in which the storm was driving us. We took down our large sails, leaving only a small one in the forepart of the boat, merely to keep it steady. The tempest increasing, the natives were alarmed, and during the occasional intervals in which the wind abated its violence, the rain came down in tremendous torrents. The rain calmed in a degree the broken and agitated surface of the ocean, that had raged with threatening violence. Our boat being small, not above eighteen feet long, and the edge, when the sea was smooth, not more than a foot or eighteen inches above its surface; every wave that broke near threw its spray over

us, and each billow in striking our little bark forced part of its foaming waters over the bow on both sides. Happily we had a bucket on board, by means of which we were able to bale out the water. In this state we continued, I suppose, about two hours, hoping that the clouds would disperse, and the winds abate; but instead of this the storm seemed to increase, and with it our danger. Most of the natives sat down in the bottom of the boat; and under the influence of fear, either shut their eyes or covered them with their hands, expecting every moment that the waves would close over us. We were not unconscious of our peril, and as a last resource took down our little sail and our mast, tied the masts, bowsprit, and oars together in a bundle with one end of a strong rope, and fastening the other end to the bow of our boat, threw them into the sea. The bundle of masts, &c. acted as a kind of buoy or floating anchor, and not only broke the force of the billows that were rolling towares the boat, but kept it tolerably steady while we were

dashed on the broken waves, or wafted we knew not whither by the raging tempest.

"The rain soon abated, and the northern horizon became somewhat clear, but the joyful anticipations with which we viewed this change, were soon superseded by a new train of feelings. *Ure, ure, tea, moana!* exclaimed one of the natives; and looking in the direction to which he pointed, we saw a large cylindrical water-spout, extending like a massive column from the ocean to the dark and impending clouds. It was not very distant, and seemed moving towards our apparently devoted boat. The roughness of the sea forbade our attempting to hoist a sail in order to avoid it; and as we had no other means of safety at command, we endeavoured calmly to await its approach. The natives abandoned themselves to despair, and either threw themselves along in the bottom of the boat, or sat crouching on the keel with their faces downwards, and their eyes covered with their hands. The sailor kept at the helm, Mr. Barff sat at one side of the stern, and I

on the other, watching the alarming object before us. While thus employed, we saw two other water-spouts, and afterwards a third, if not more, so that we seemed almost surrounded by them. Some were well defined, extending in an unbroken line from the sea to the sky, like pillars resting on the ocean as their basis, and supporting the clouds; others assuming the form of a funnel, or an inverted cone attached to the clouds, and extending towards the sea beneath. From the distinctness with which we saw them, notwithstanding the density of the atmosphere, the farthest could not have been many miles distant. In some we imagined we could trace the spiral motion of the water as it was drawn upwards to the clouds, which were every moment augmenting their portentous darkness. The sense of personal danger, and immediate destruction if brought within the vortex of their influence, restrained in a great degree all curious, and what in other circumstances would have been interesting observations on the wonderful phenomena around

us, the mighty agitation of the elements, and the terrific sublimity of these wonders of the deep. The roaring of the tempest, and the hollow sounds that murmured on the ear as the heavy billow rolled by in foam, or broke in contact with an opposing billow, seemed as if 'deep called unto deep,' and 'the noise of water-spouts might almost be heard, while we were momentarily expecting that the mighty waves would sweep over us.' The hours that followed were among the most solemn I have ever passed. Although much recurred to memory that demanded deep regret and the most sincere repentance, yet I could look back upon that mercy which had first brought me to a knowledge of the Saviour with a gratitude *deeper than I had ever felt before. Him, and Him alone*, I found to be a refuge, a rock in the storm of contending feelings, on which my soul could cast the anchor of its hope for pardon and acceptance before God: and although not visibly present as with his disciples on the sea of Tiberias, we could not but hope that

He was spiritually present, and that should our bodies rest till the morning of the resurrection in the unfathomed caverns of the ocean, our souls would be by Him admitted to the abodes of blessedness and rest. I could not but think how awful my state would have been had I in that hour been ignorant of Christ, or had I neglected or despised the offers of his mercy: and while the reflection induced thankfulness to Him, through whom alone we had been made to share a hope of immortality, it awakened a tender sympathy for our fellow-voyagers, who sat in mournful silence at the helm and bottom of the boat, and who seemed averse to conversation. Our prayers were offered to Him who is a present help in every time of danger, for ourselves, and for those who sailed with us: and under these or similar circumstances several hours passed away. The storm continued during the day; at intervals we beheld through the clouds and rain one or other of the water-spouts, the whole of which appeared almost stationary, until at length we lost sight of them alto-

gether, when the spirits of our native voyagers evidently revived.

"Throughout the Pacific, water-spouts of varied form and size, are among the most frequent of the splendid phenomena, and mighty works of the Lord, which those behold who go down to the sea in ships, and who do business upon the great waters. They are sublime objects of interest when viewed from the shore; but when beheld at sea, especially if near, and from a small and fragile bark, as we had seen them, it is almost impossible so to divest the mind of a sense of personal danger, as to contemplate with composure their stately movements, or the rapid internal circular eddy of the waters."*

Here Edward paused, and returned the volume to his mother, for he perceived that the pencilled lines with which she was accustomed to mark such passages as she wished them to read, extended no further. As he gave it to her, he said, "Thank you,

* Vol. II. Polynesian Researches.

dear mother, for thinking of this account of Mr. Ellis, and giving it to me to read; it has brought the scene so completely before me, that I actually felt as if I could see the water-spouts with my own eyes, and I longed to be in the boat with them."

"Oh, brother!" exclaimed Emma, "how could you wish to be there! I am sure all the time you were reading, I could not help thinking how glad I was that I was in uncle's nice parlor, instead of being tossed about on the ocean in that dreadful storm. Even hearing of others having been there, made me tremble all over."

"Remember, my daughter," said her mother with a smile, "Edward belongs to the stronger sex, and has by nature a very courageous disposition, though I cannot but think if he were to find himself at this moment transferred to a frail bark, which was tossing about on the tempestuous ocean, and an awful water-spout before him, he too might wish to be on the safe and quiet land."

"I think still, dear mother," he replied,

"that I should like to be present at such a scene, but I will not be too *sure*, because you have taught me to see what a deceitful heart I have."

"There is one thing, my dear children," observed Mrs. Stanley, "that I wish to notice particularly in Mr. Ellis's narrative, which is the description that he gives of the peace of mind which faith in Christ imparts at such moments. You will most probably never be placed exactly in similar circumstances, but sudden death may threaten us on land as well as on the stormy ocean; a thousand events may occur to place your lives suddenly in peril, and believe me, my children, such moments are not the ones to make your peace with an offended God. The soul is too much agitated, too full of terror, to be master of its powers. So much is felt necessary to be done, that the mind becomes bewildered, and too often nothing is done, I fear, effectual to salvation, and the poor thoughtless despiser of God's word, or the negligent hearer of it, pass from these scenes stupified almost with ter-

ror, and only regain their full powers of consciousness, when it is too late, and they find themselves alone and helpless—self-condemned sinners before the throne of God. Mr. Ellis remarks that he found in the prospect of death, 'Christ, and Christ only, could be a refuge for his soul.' Oh! let us pray continually, that the 'Almighty and everlasting God would mercifully look upon our infirmities, and that in all our dangers and necessities, He would stretch forth His right hand to help and defend us, through Jesus Christ our Lord.'

'While I draw this fleeting breath,
When mine eyelids close in death,
When I rise to worlds unknown,
And behold thee on thy throne,
Rock of Ages! cleft for me,
Let me hide myself in thee!'"

CHAPTER VI.

"Gem, flower, and fish,—the bird, the brute
Of every kind, occult or known,
(Each exquisitely formed to suit
Its humble lot, and that alone,)
Through ocean, earth, and air fulfil
Unconsciously their Maker's will,
Who gave without their care or thought
Strength, beauty, instinct, courage, speed;
While through the whole His pleasure wrought
Whate'er His wisdom had decreed."

It is always delightful, in whatever situation we may be placed, after having retired to rest in the midst of a tempest, to awake on the following morning and find the storm has vanished, and the night of darkness has given place to a day of bright sunshine. But though this change is most grateful every where, it is particularly so to those who at such times may be stationed near the ocean. Its waters then appear of a more beautiful blue, and the waves, not recovered from the agitation of the past storm, are dashed with greater power and majesty on the beach. The spectator feels

his spirits raised in a more than ordinary degree, and he is almost tempted to think he is better than usual, because he is happier.

The party at the cottage, as they looked out on the face of nature on the morning after the storm, seemed inspired with feelings of this kind. Every one appeared full of life; and when, after breakfast, Mr. Benson's voice was heard as he summoned his guests, saying, "To the beach! to the beach! I prophesy that you will find some spoils that are worth gathering, after the tempest of yesterday," the cheerful summons was joyfully met and answered by the happy voices of Edward and his sisters, and in a few moments the party were wending their way to the sea.

Mrs. Stanley remained at home to attend to something which required her presence, and while she was thus engaged in a back room, she heard the light and rapid footsteps of a young person crossing the piazza, and in a moment after, Anna entered the apartment in which her mother was sitting.

Her hat was thrown back, and her generally mild and gentle countenance was flushed with pleasure, as she opened her apron to show her mother the treasures she had been collecting. "See, dear, dear mother, what I have found; they look very much like the sea-eggs which you have in your cabinet; can they be the same kind of thing? Yours have not these sharp green things like thorns over them, and are prettier than mine; but I hope these will look whiter when I have washed the sand off them."

Her mother took one of Anna's new found treasures into her hand, and after she had looked at it for a few moments, she said, "You have indeed been very fortunate in finding these things, my dear. They are, as you supposed, sea-eggs, or as they are sometimes called, sea-urchins; and though they are not so white as those which you have seen in my cabinet, they are much more valuable. Yours have been killed very recently, probably by being thrown violently on the beach during the tempest

ECHINUS, OR SEA-URCHIN

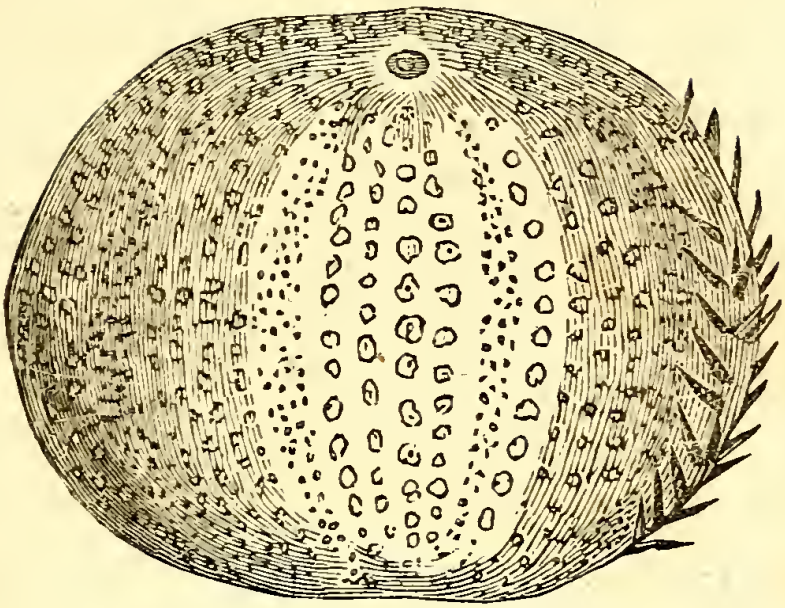


FIG. 1.
Shell, with a few spines remaining.

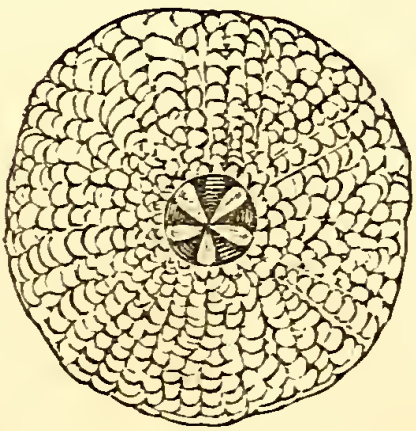


FIG. 2.
Lower part of the shell, showing the mouth and five teeth

Fig. 2, taken from Kirby's Bridgewater Treatise.

last evening. They contain the animal in the inside, and will give us an uncommonly good opportunity for examination."

"Please, dear mother," said Anna, "to give us this evening some account of them, for it would be such a pity for you to tell me about them now, when brother and Emma are away. You know they will enjoy hearing of the sea-urchins very much."

By and by, the rest of the party returned, but when they had each brought their offerings, Anna's were pronounced decidedly the most valuable. Mrs. Stanley watched the countenances of her children with some anxiety, for she was fearful lest some unamiable feelings might be displayed by them on this occasion. Though the prize gained was in this instance a small one, she knew the corruptions of the human heart too well not to be aware that the most trifling advantage possessed by another, will sometimes be sufficient to rouse envy in the breast. But the heart of the Christian mother was gratified in seeing how warmly

Edward and Emma sympathized in the pleasure of Anna. She had found several sea-eggs, and she insisted on dividing them with her companions: after they had been examined for a time they were put by until the evening, when Mrs. Stanley promised to give her children some little history of them.

When the young Stanleys received a message from their uncle after tea, summoning them to the drawing-room, they immediately came into the house, and when they entered it, they observed he had arranged Anna's sea-urchins on the table, and by their side had placed some beautiful white ones of his own, which were entirely free from spines.

"The Echinus, or Sea-egg," said Mrs. Stanley, "is a very large genus of animals, included like the Medusæ, until lately, under the class of Zoophytes. These animals all have round or oval-shaped shells, though they are divided into a great many species. Many of these are now only found in a fossil state, numerous specimens of

which are to be seen in all the large museums of this country. These I will not trouble you with at this time, and will only describe some of those which are found abundantly at the present day in a living state, in different parts of the world. I told you some evenings since, that the Medusæ have been separated by some modern naturalists into an order to which they give the name of Gelatines; another order is added to this, and both together form Lamarch's class of Radiaries. It is under the second that the Echinus, or sea-urchin is placed, with some other very interesting sea-animals, that I hope to be able to tell you about hereafter, as they are quite as interesting as any you have yet heard of."

Mrs. Stanley now took up one of the shells of the sea-urchin which her brother had given her, in order to explain its singular formation to her children. It was not, like Anna's, covered with spines, neither was it closed at the bottom, but was beautifully white, and entirely hollow throughout. She told them that the empty sea-urchin shells

had probably been beating about on the shore for a long time, and had been whitened by the effect of the heat of the sun.

"I am going to call in the aid of a very powerful assistant," said Mrs. Stanley, "in my attempt to describe the singular formation of the sea-urchin, since I find his work contains more valuable information than that of any other author I have consulted; and I shall be enabled also to avail myself of some of his interesting plates in addition. The author to whom I allude is the Rev. William Kirby of England, in his number of the Bridgewater Treatises. I will give you, in as simple language as I can, the account of 'the wonderful manner in which the house that these animals reside in, is constructed by its Divine builder,' to use his own language. The shell of the sea-urchin is formed by two coverings or membranes, one outer and thicker, and the other very thin. Between these is a shell of a limy kind, composed of a great number of many-sided pieces, which you will perceive by looking at this shell which I

have broken ; you observe it does not crack in a straight line, or in an irregular crooked one, but in pieces which have the same zigzag shape uniformly. I can explain the construction of this shell better by taking one apart, and your uncle has been so kind as to give me a shell on purpose to break for you."

"Thank you, dear uncle, for your kindness," said all the young people.

"I will now separate it," continued Mrs. Stanley ; "you observe that I have divided it into many little strips shaped somewhat like the slices of a muskmelon when cut for table. Edward may count the number."

He did so, and told his mother that there were twenty of these pieces.

"You will observe," said she, "that ten of these pieces are covered with round lumps sticking out from the shell, some of which are larger than others ; the remaining ten are pierced with rows of little holes, like pin holes ; it is from the rows of holes that the tentacles or feelers of the animal are thrust out, while the rows of little pro-

tuberances or lumps were covered with the spines. Observe when I pluck off a spine from one of Anna's sea-urchins; underneath it is one of these lumps. Each one then in these rows had once a spine fitted on it like a ball and socket. The animal, when alive in the inside of the shell, was able to move the spines at pleasure, or thrust its feelers through these tiny holes."

"I believe, mother," said Edward, "that the sea-urchin uses these spines to turn itself about with, like the spokes of a wheel; at least I have read of their doing so."

"It is, I believe, generally thought so," replied Mrs. Stanley; "and Mr. Kirby says expressly, that he thinks the sea-urchin employs its spines in moving itself about, using some as legs to advance forward, and others to prevent itself from being thrown back again. And he tells us, that it is by means of the spines that they bury themselves in the sand on the sea-shore. Spallanzini, however, was of a different opinion, and if you are disposed to listen to him again, I will tell you how he came to this conclusion."

"I will give my vote," said Mr. Benson, "to allow the traveller a hearing, as I have not forgotten his history of the Medusæ. What say the young people? All who are in favor of my motion will say aye."

The young Stanleys gave their votes in the affirmative, and Mrs. Stanley went on with her narrative.

"The traveller declares that the fact of the sea-urchins being armed with thick spines, and also furnished with a prodigious quantity of feelers which they thrust forth or conceal at pleasure, is too well known for any one to attempt to dispute. While this is evident to all who will take the trouble to examine the animals, it has been by no means so settled a matter, which of these two parts of its body it uses in moving from place to place. Some time before writing this account, Spallanzini tells us that he had an opportunity of examining a number of sea-urchins, in the Gulf of Spezzia, and the result of these experiments convinced him, that if the animal is taken out of the water, (in which state it will live but a short

time,) it will move itself solely by its spines; but on the contrary, so long as it remains in its native element, its removal from place to place will be effected entirely by means of its tentacula or feelers. He took five sea-urchins, which were brought up by the coral fishermen when fishing for coral, and put them immediately into a bucket of sea-water, in order to examine them on his return to Messina, a few hours afterwards. While he was returning he observed, that notwithstanding the agitation of the water, caused by the motion of the bark, all five of them had ascended from the bottom of the bucket up the sides, almost to the top, where they remained fixed by means of their feelers. This convinced him that the feelers were not only of use to fasten the animals, but also to enable them to move about. He then separated them, though with a good deal of difficulty, from the bucket, because he wished to watch them ascend, and see how they managed matters, and placed them at the bottom of a glass bucket, with smooth, straight sides. One

of them he placed with its mouth upwards, which is an unnatural position for the sea-urchin, for when at home, in the bottom of the sea, they always have their mouths downwards. This poor thing, feeling uncomfortable in the position in which the traveller had placed it, made a violent effort to recover its natural posture. On one side it thrust out fifty or more of its feelers, spreading them as much as possible, and fixing them to the bottom of the vessel. It then drew them in, and by so doing somewhat raised its body. It was now, as it were, on one side, and it remained in that position by holding fast with its contracted feelers. It then put forth other feelers on the same side, drew in these also when firmly fixed and let go the others first thrust out, and made a still farther turn of its body. When it had performed this curious operation several times in succession, it succeeded finally in getting its mouth in its natural position, downwards. "Now what do you think of our little friend's contrivance?" asked Mrs. Stanley, with a smile.

"I think," said Edward, "that he is an uncommonly smart fellow, and really seems to have had a will of his own."

His mother remarked, "We may indeed say with Kirby, 'Who can say that the all-wise Creator did not foresee all the situations into which this animal would be thrown, so as to provide it with every thing that it would require.' We will now go back to Spallanzini's five urchins which we left in the glass bucket. He tells us that after the one which I described to you succeeded in getting back to its natural position, it, with the rest, travelled rapidly up the sides of the bucket, until they all reached the top of the water. In the ascent, he ascertained by a means which I cannot approve of, that the animals only used the feelers—it was by cutting off the spines of one of them; when, notwithstanding this loss, it turned itself over and moved up the bucket by its feelers alone, as well as the others which still possessed their spines."

"You told us, mother," said Edward, "that after the sea-urchins had risen to the

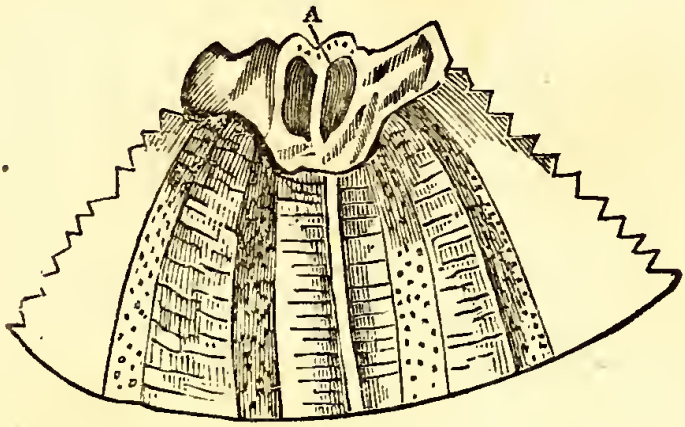
top of the water, they fastened themselves to the sides of the bucket. I do feel very curious to know by what means they could fasten themselves to the smooth glass so as to make it difficult to take them off again."

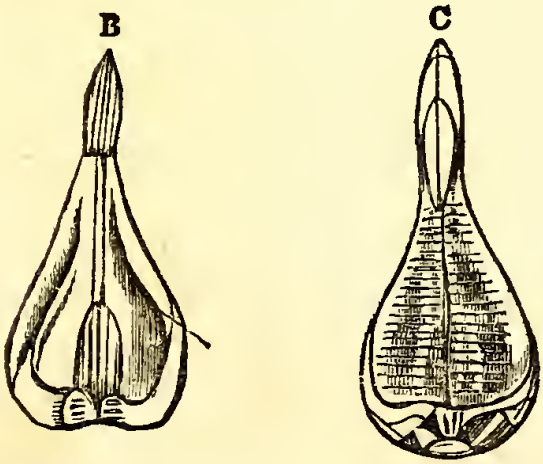
"I do not wonder that your curiosity is excited, Edward," said Mr. Benson; "I am sure mine is, and I could hardly credit the fact, did not your mother give it on such good authority; and were I not fully convinced of the infinite wisdom and love of our Heavenly Father, in meeting the wants of the most humble of his creatures."

"I must own," said Mrs. Stanley, "I was deeply affected with the proof of 'that tender mercy which is over all His works,' when I read this part of the narrative of Spallanzini; and I could not but feel a most painful void in it, when I found him describing with such minuteness the skill of the contrivance, and yet not offering one momentary tribute of praise to Him who had designed it. I found myself saying invol-

untarily, 'Praise the Lord, oh my soul, and all that is within me: Praise His holy name!' He mentions a fact which proves the tenacity with which the sea-urchins adhered to the sides of the smooth glass bucket. While one of the creatures was in this position, he laid on its spines a lead weight of 32 oz.; notwithstanding which, it still kept a tight hold; and before he could force it down, he was obliged to add an additional 7 oz. piece of lead. After mentioning this, he says, 'But what shall we suppose to be the cause of so strong an adhesion to bodies of so great smoothness as glass? The following observations will serve as an answer: If we view the feelers of the sea-urchin through the sides of the glass vessel at the time the animal stretches them out, and before he fixes them, we shall find that they are of a white color, and that each of them terminates in a little protuberance, having a hole in the middle of it. When one of the feelers is viewed through a microscope, it is found that there is a little canal leading all the way down

A SECTION OF THE INSIDE OF THE SHELL OF THE ECHINUS, OR SEA-URCHIN.





A. One of the frames to which the jaws are attached.
B. The outside of one of the jaws.
C. The inner and furrowed side of the jaw.

Taken from Kirby's B. T.

the feeler from its root in the body of the animal, and ending in this little hole, in what we call the foot. If the feeler is pressed with a piece of wire, there will be found issuing from this small hole, a very little drop of extremely sticky liquor. With this glue, as it were, the animal fastens itself where it pleases. Spallanzini tells us that the feelers were so very transparent, that he was enabled by the aid of a microscope, to see the means which the sea-urchins employ to obtain so strong a hold; they press their little feet strongly against the glass, and thus force away the sea-water, and then stretching them they form a little cavity with the bottom of them, into which they force immediately the glutinous matter which fastens them so firmly."

"This is indeed wonderful, mother," said Edward, "and is it not peculiar to the sea-urchin?"

"No, my dear, it is not," said her mother. "There are many other varieties of shells, which attach themselves in a similar manner. The common marine muscle posses-

ses the power in a striking degree. Smellie, in his interesting work on Natural History, asserts some extraordinary facts with regard to this animal, which I will relate to you on another occasion. At present, we must confine ourselves to the sea-urchin ; at least, if you feel inclined to hear any more of the won ers of its dwelling house."

"I am sure we all are anxious to do so," replied Edward, "I was only afraid there was no more to be told."

"You have been informed of many of the proofs of the skill and tender considerations of God, which are displayed in the formation of this humble inhabitant of the mighty deep, but other and still more striking ones, remain to be told. Kirby assures us, 'that the most powerful and complex organs with which the Creator has furnished them, are their jaws and teeth.'"

Emma and Anna both showed symptoms of surprise and amazement, at the mention of these organs in the sea-urchin, and Emma took one of the sea-urchins which her sister had found, and turned it round

and round with a bewildered look. Edward laughed outright. "Poor Emma," said he, "you look quite as much puzzled as you did that famous day when I tried to make you look at some clams feeding."

She bore her brother's smile very good-naturedly, and turning to her mother, begged that she would be so good as to show her where the mouth and jaws of the sea-urchin were. Her mother took up one of the shells and showed Emma in the bottom of it, a little space directly in the middle, which seemed to be formed of something like parchment. In the centre were 5 small white teeth, (plate 3, fig. 2.) These she told her were the mouth and teeth of the animal, but its jaws were in the inside. Mrs. Stanley then took one of Anna's shells and asked whether she might open it. Anna cheerfully consented, and her mother took it apart in order to explain the wonderful manner in which it was made.* It consisted of five pieces, each of which formed an arch, and the whole a frame which she

* Kirby's Bridgewater Treatise, page 112.

said had been compared to a lanthorn without a skin," (plate 4, fig. a.) To these were attached the moveable part of the apparatus, consisting of 5 jaws, each containing a long tooth, (plate 4, fig. b, c,) the teeth converging so as to close the mouth. Altogether, this complex machine consisted of 25 pieces, moved by 35 muscles." She told them that this apparatus was of a much more powerful kind, than that furnished by God to the mighty whale, that it was supposed the little sea-urchin really lived on food that was more difficult to bruise and chew, than that which supplied the wants of the great monarch of the deep.

"I cannot omit," said Mrs. Stanley, "in conclusion, to quote a few lines from Mr. Kirby, where he closes his account of the sea-urchin, since it will furnish a most appropriate termination to the conversation of the evening. After describing all their various organs, he continues, 'The workmanship also, in these animal structures, is as beautiful and striking, as the contrivance manifested in them is wonderful. Their

protuberances, their variously sculptured spines, their tentacular suckers, all by their perfect finish and admirable forms declare —'The hand that made us is divine,' since they exceed in these respects, the most elaborate human works.'"

CHAPTER VII.

"One spirit—His,
That wore the platted thorn with bleeding brows,
Rules universal nature."

ONE evening, when the party at the cottage were seated at the open windows, gazing at the beautiful ocean, which was tinged with silver by the beams of a new moon, Mrs. Stanley inquired of her brother, if he had ever been so fortunate as to find any of the Sea-anemonies, or animal flowers, in their open state, as she said she had been told they were occasionally met with on the rocks of Nahant, at very low water.

"So I have been told," replied Mr. Benson, "though I have never been so fortunate as to see them. It requires younger

and more adventurous limbs than mine to scale these precipitous rocks."

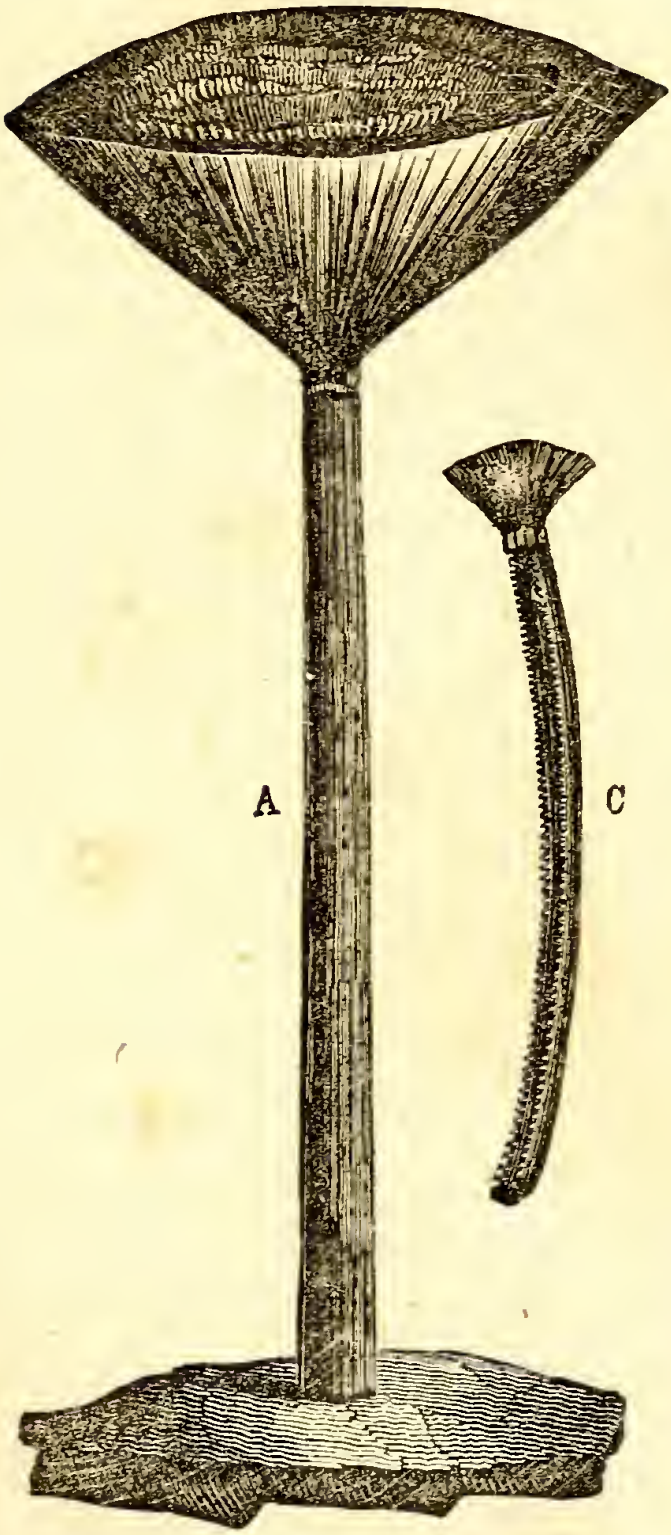
When Mr. Benson had ceased speaking, Emma, who was the most inquisitive, eagerly inquired what animal flowers were, and begged to know if her mother would not be so kind as to tell them about them.

"If you can have patience, my dear, to wait until to-morrow evening," said her mother, "I will try to gratify you. You know I always like to collect my materials beforehand, so that I may be able to give you as much information as I can upon every subject."

They were quite ready to wait their mother's convenience, and did not importune her with entreaties to gratify them at that present moment, as many young persons are accustomed to do.

The long wished for hour at length arrived, and the young Stanleys took their places by their mother's side, with minds eagerly intent on receiving all the information she had to communicate with regard to the new object of inquiry—the Sea-anemonies.

ACTINIA, OR SEA ANEMONE



A. Stalk.
B. Flower.
C. Animal.
D. Rock to which it is attached.

Taken from Plate in "Sketches of Naval Life."

"If you had not already told us of so many 'wonders of the deep,' mamma," said Anna, "I should hardly know what to make of such a thing as an animal flower. I suppose it must be some kind of creature that looks very much like a flower."

"Yes, Anna," replied her mother, "these animals do indeed resemble flowers, so much so, that they were for a long period classed with the members of the vegetable kingdom. I remember when I was a little girl my curiosity was very much excited by a description of these extraordinary creatures, which was given me by a gentleman who was a friend of my father's, and had passed much of his life in the West Indies. He told me that these curious flowers grew on the rocks of St. Vincent, and that they looked so beautiful with their gay colored blossoms, that he had a strong desire to pluck one, and examine it more closely: he stepped cautiously out on the wet and slippery rocks to pick one, but to his amazement, as his hand approached the object of his desire, the flower vanished.

Getting somewhat irritated at being thus repeatedly baffled in his attempts, he struck one quickly with his cane, but in vain. At last he perceived a round piece of coral with a hole, from which one of these bright visions appeared; he stretched forth his arm quickly and gained the coral indeed as his prize, but the genii of the stone had disappeared. He was not aware of the fact that plunging it in sea-water would have made the animal re-appear, and therefore he preserved the coral without having his desires gratified. This prison-house of the animal flower he showed me, and my childish curiosity was excited to a great degree, and I gazed upon it as I would on some mysterious being, for I was at that time entirely ignorant of the existence of such an animal as that which is called the Sea Anemony."

"I remember, mother," observed Edward, "your telling me of an account of the animal flower which you had read in Mr. Jones's Naval Sketches, and your speaking to me of the plate of one, which

he had copied from life. I am really very curious to know how they are able to put on these beautiful forms, mamma, and hope you will be so kind as to give us their history."

"You probably recollect," said Mrs. Stanley, "that I told you when describing the Echinus, or sea-urchin, that it had been classed by modern naturalists, with some other interesting marine creatures, under the general name of Radiaries. Now the Actinia, or Sea-anemony, is among these genera. It differs in some respects from the sea-urchins, and the Gelatines, or Medusæ; whereas these two genera of creatures roam about in search of food, the latter of the two only attaching themselves to the rocks for safety, the Sea-anemony adheres to them uniformly, and only separates on extraordinary occasions. I do not know whether I could in any way give you so good an idea of the Actinia, as by reading the description of one of them furnished by the author of Naval Sketches, to which Edward has referred. He introduces us to those which

grow in the harbor of Port Mahon, in these words. 'Let me describe a curiosity I saw in the harbor a day or two since. As I sauntered along its shores my attention was drawn to a beautiful flower at the bottom, where the water was near a fathom in depth. It grew on a stalk about three eights of an inch in diameter, and about ten inches in length; was in shape like an inverted cone, about five inches in diameter, and was variegated with brilliant colors, red, yellow, and purple. It was a beautiful thing, and I wanted it; so I determined to knock it off, hoping some chance might bring it to the shore. I threw, and saw that I had struck it, but when the water cleared up the stalk was there, but I could not discover the flower. After a vain search I went on further, and came to another near the shore. I thought I was sure of this, and got a stalk to draw it to me, when, as I touched it—quash—the whole disappeared. It was all animal, flower and all. I have since procured several, and have preserved them. The stalk is formed

by concentric coats of gristly matter, which are transparent when the outer one is removed: it is attached to the rocks below. It forms a tube, in which is an animal about seven inches long, with two rows of feet in its whole length; at its upper end is the head, and rising from the latter, the flower I have spoken of. This is formed by a vast number of very delicate fibres, each with an exceedingly fine and variegated fringe, placed like that of a feather: they do not form a single cup, but several, one inside of the other, and their roots so ranged as to produce a spiral channel reaching to the animal's mouth. They have a strong sensitive power, and as soon as touched are dragged by the animal into the stalk. After a few minutes it ascends again, and the flower spreads out as before: doubtless they are intended for taking food. A touch will spoil them, so delicately are they formed. I cut off the flower, and pass a paper under it in water; then by laying it on a board and pouring water on it, spread it out as I wish it; when dried it

looks like a painting. They are called water-pinks by the natives.'"

"Oh! mamma," said Emma, "what a nice description that is which you have given us; I think I can see the flower before me now."

"Look at this plate with which the author accompanies the account, (see plate 5,) and then I think you will probably form a correct idea of the Sea-anemony," said her mother, as she showed her children the engraving. "I have some farther notices to give you of these singular creatures on the authority of Mr. Smellie. He tells us that the animal assumes such a variety of figures, that it is difficult to describe it under any particular form. In general, their bodies have a resemblance to a cone with the point cut off. A cone, Emma, is longer than it is wide, it is circular at the bottom, and continues to taper off in a round form to the top, where it ends in a point. With regard to color, some of the Sea-anemonies are red, some greenish, some whitish, and others are brown. When the mouth, which

is very large, is fully open, its edge is surrounded with a great number of fleshy threads, or horns, like those of the snail. These horns are disposed in three rows round the mouth, and give the animal the appearance of a flower. Through each of these horns it squirts jets of water. What is peculiar in the formation of these creatures is, that the whole interior of their body or cone, is one cavity or stomach. When searching for food they extend their horns, and entangle any small animals which may happen to lie in their way. When they meet with their prey they instantly swallow it, and shut their mouths close like a purse. Though the animal-flower should not exceed an inch and a half in diameter, as it is all mouth and stomach, it will swallow large shells, which sometimes remain in the stomach for several days. Their nutritious parts are at last, however, extracted: but how does the animal get rid of the shell? The creature has no other opening in its body but the mouth, and this is the instrument by which

it both receives nourishment, and gets rid of the unprofitable parts of its food. When the shell is not too large the animal-flower has the power of turning its inside out, and by this strange manœuvre the shell is thrown out of the body, and the animal resumes its former state. I have," said Mrs. Stanley, "given you this account almost exactly in the language of Mr. Smellie; but I cannot forbear at this point interposing a few words, in order to lead you, my dear children, to observe the kind consideration of our heavenly Father towards the least of his creatures. While His infinitely exalted mind is directing the course of His providence, whose ways are often, as the prophet beautifully expresses it, 'so very high that they are dreadful,' setting up one mighty empire, and putting down another, He yet does not become unmindful of the feeblest insect, or the animals which seem to hold the lowest place in creation, and who are buried under the mighty ocean. If He were not as infinite in love as He is in wisdom, would He thus have considered

such apparently trifling circumstances as the one I have just mentioned with regard to the Sea-anemony. The animal He remembered was unprovided with many things which other creatures possess; He saw what was to be its food, and that it might often be subjected to pain and inconvenience, by having its stomach filled with the hard parts of the shell-fish on which it was to subsist, and therefore in tender consideration for its comfort, He kindly gave it a power not furnished to higher animals, that of turning its own body inside out, and in this manner enabled it to get rid of the troublesome matter. This is still more strikingly displayed by another part of its formation. I have told you that it could thus empty its stomach, but I ought to have said in addition, that it can only do so when the shell is presented in one position, which is the common one; but Mr. Smellie observes, 'what is extremely singular, near the lower part of the body *it splits*, as if a large wound had been made with a knife, and through this gash the shell is thrust

out, if it has so happened that it has been presented in a wrong position.' I mentioned to you that the Sea-anemony possessed the power of moving itself from the rocks to which it is generally fixed, though it seldom has occasion to exert it, and it does so in the following manner. 'The outside of its body is furnished with numerous muscles, these muscles are tubular, and are filled with a fluid which makes them project in the form of prickles. By means of these muscles the animal is enabled to perform its very slow movements. It can also, when it pleases, loosen its base from the rock, place what was its head downwards, and employ the horns round its mouth as so many limbs. Still, however, it moves very slowly.'"

When Mrs. Stanley had concluded her narration of the appearance and habits of the Actinia or Sea-anemony, she received the warm thanks of the group by whom she was surrounded, and Anna begged to know if there were any other marine animals which put on such beautiful forms as

those did, which her mother had just described.

Her mother told her that there were many others equally handsome, which were already known to naturalists, though the anemonies were the most numerous, and bore as a class the most striking resemblance to the vegetable world. And she also informed her children that there was great reason to suppose, there were many lovely marine productions that were still unknown to man, and which "the dark unfathomed caves of ocean bear." "There is one of these marine beauties described by Mr. Kirby, which I cannot forbear to tell you of," said Mrs. Stanley. "He informs us that an engraving of it has been given in the transactions of the Linnean Society of London, under the name of Tubularia Magnifica. The horns or rays of this animal he describes, 'as fixed on a common base, and forming one glorious and radiant crown, with rings of the most beautiful red and white; of these there is a double circle, the inner ones being shorter than

the outer ones; when they are all expanded, it is nearly six inches in diameter from one side of the flower to the other. Whenever the animal is alarmed it withdraws this splendid figure, and the tube itself into its burrow in the living rock, as a safe refuge from its enemies.' He tells us also that any one who has had an opportunity of comparing this expanded animal-blossom with some species of the passion-flower, would be struck with the resemblance. He thinks the principal object of the uncommon length and number of their horns or rays, may be for capturing, as in a net, the numerous animals necessary for their support, who may perhaps also be attracted by their great beauty."

Mrs. Stanley here drew out her watch, and finding she had a half hour to spare, she told her children that she would, if agreeable to her brother, tell them about some other brilliant beauties of the sea, that she had alluded to formerly. "By all means," said Mr. Benson, "I believe I am taking almost as much pleasure as your

children, in listening to your conversation; I find not only enjoyment, but profit also, for it quickens my gratitude to our gracious Lord, to have these proofs of His love presented to my mind."

The lady then continued, "When we were speaking of the luminous appearance of the sea, I told you, I believe, that it was supposed to be principally occasioned by the presence of the families of the Gelatines or Medusæ. There are, however, some other very striking instances of marine animals which possess the power of giving light, which appear more closely allied to the animal-flowers in their formation than to the Medusæ. They belong to a class of animals to which some learned men have given the name of Tunicaries. They are thus characterized as a class. 'The animal either leathery or gelatinous, is covered by a double tunic or envelope. The outer one somewhat similar to the shell of other marine creatures, is provided with two apertures; the inner one somewhat like the fleshy animal which inhabits

these shells. Body oblong—divided into many little cavities, without a head. These marine creatures are sometimes solitary, in other species many are attached together.' Kirby thus speaks of the latter, 'The Creator when He filled the waters of the great deep with that infinite variety of animals, of which every day brings genera and species before unknown to light, willed that many of them should, as it were, form a common body, consisting of many individuals separate and distinct, as inhabiting different cells, but still possessing a body in common, and many of them receiving benefit from the enlarging and contracting of a common organ: thus presenting a type of those animal communities where numerous wills unite to effect a common object. The land as far as I can recollect, exhibits no instance of an aggregate animal; nor the ocean of one, which like the beaver, ant, wasp, white ant, and bee, forms bands to build and inhabit a common house, and rear a common family. Instead of sending the social marine animals forth in myriads

to collect food and materials for their several buildings, God took the vegetable world as the model for their general structure, in many cases fixed them to the rock or stone, united them all into one body, which under a common cover, contained often innumerable cells, from which were sent forth by the occupant of each a set of organs to collect food, from which by some curious process they could prepare materials to enlarge their common house, and often cause that influx and reflux, to compare small things with great, resembling the tides of the ocean, and by which the sea-water is at one moment drawn in, and then thrust out by these animals: this office in some of the Tunicaries seems to be effected by a central organ or pump, which is common to the whole community.' Some of these animals are phosphoric, and so transparent that all their internal organs and movements can be plainly seen. Sometimes rows of from forty to fifty of one species called the Salpes, are to be seen fastened together. These are perfectly regular;

that is to say, all the individuals are of the same height, and the heads of one row are turned to the same side, and those of another to the opposite. Sometimes they are carried by the waves in a spiral line, and again in a straight one. In the sea, during the day, they look like white ribands, and during the night, like ribands of fire, which are now rolled up, and then spread out again. We can only form a conjecture of the object of Divine Providence, in endowing these animals with an instinct so singular. Perhaps it may be to preserve them from being destroyed by the force of the waves, as they are so very frail, or perhaps the stronger light which they thus produce may be for defence. Though several of these animals belonging to the class of Tunicaries, are interesting on account of their singularity and beauty, I shall only select two, says Mr. Kirby, (for I am quoting his words almost exactly, only altering them when I made my extract to use more simple ones.) One of these is peculiarly striking, and I have copied Mr. Kirby's plate of it, in order

to render this description more plain." She then showed the little party this painting. Her children exclaimed at the sight, "Surely, mother, this cannot be meant for an animal; we should have taken it for almost any thing else rather than for a living creature."

"I do not wonder," said Mrs. Stanley, "that you who are so inexperienced in such matters, should be a little incredulous as to the fact of this plate being intended to represent living creatures. The celebrated Lamarch, who has devoted so many years and so much talent to the study of natural history, when speaking of this animal, and the painting of it, from which Mr. Kirby's was originally taken, remarks, 'Who would think that the Pyrosome' (which is the name he gives it) 'was an assemblage of little aggregate animals: any one that looked at it, or at the plate of it, might mistake it for a simple polype, with a number of leaf-like appendages growing from its skin; but a closer examination of it would give him a very different idea, and he would

discover, with wonder, that it was a mass filled with animals united by their base. The common body that contains these creatures, resembles a hollow cylinder,* closed at the upper extremity and open at the lower. This body, or mass, is gelatinous† and transparent; a number of little tubercles, or pimple-like lumps, of a firmer substance than the tube, but at the same time transparent, polished, and shining, cover the surface; some of them are terminated by a lance-shaped leaflet.' "

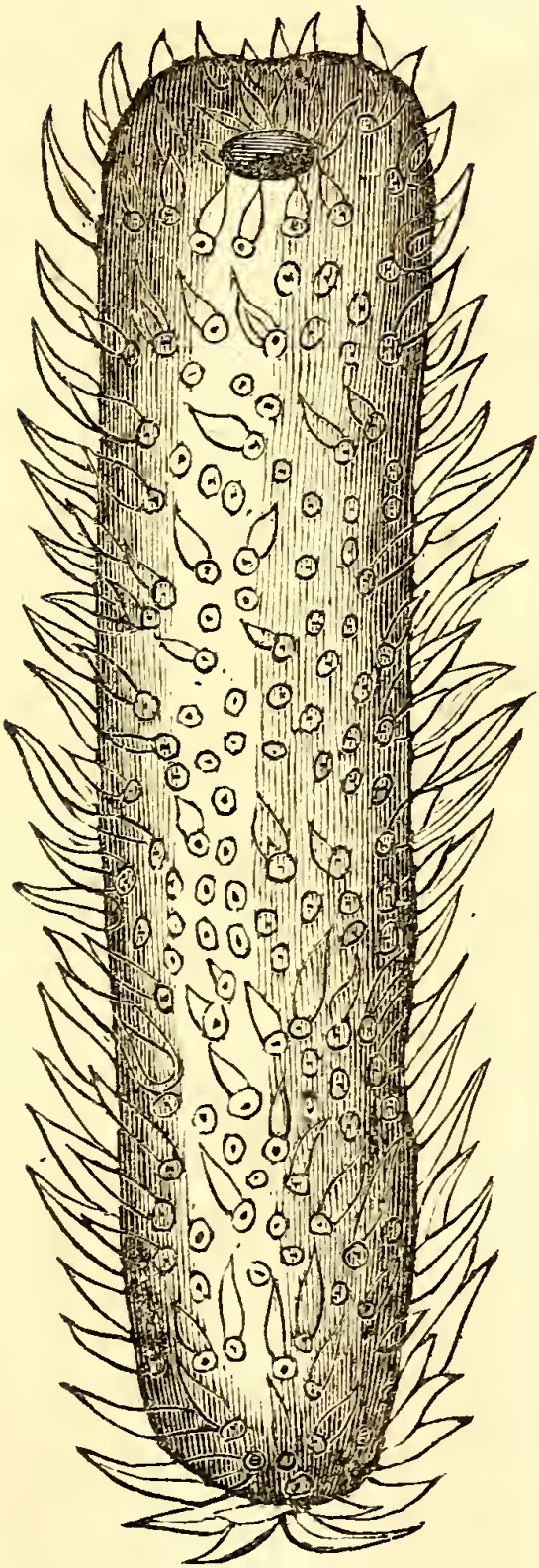
"How large are these wonderful creatures, mother?" inquired Edward.

"They are said to vary in size according to the different situations in which they are found," she replied. "Those which inhabit the Atlantic are about five inches long, while the Mediterranean species, one of which this plate is intended to represent, sometimes attain the length of fourteen inches. Mr. Kirby tells us 'that their power of emitting light is so great, that in

* See plate 6.

† Of the nature of jelly.

PYROSOMA GIGANTEUM.



the night they cause the sea to appear on fire.' Nothing can exceed the dazzling light and brilliant colors that these floating bodies exhibit—colors varying in a way that is truly admirable, passing rapidly every instant from a dazzling red to saffron, to orange, to green, to azure, and thus reflecting every ray which is exhibited by the heavenly bow."

"Oh, mamma," exclaimed Anna, "how beautiful, how splendid these creatures must be! Please now to tell us how they contrive to move along in the ocean. Do they use these little things that look like leaves for feet?"

"No, my dear, they do not, I believe; they lie in the water lengthwise, like a piece of wood, and are carried along in the same manner by the current. Each one of these little inhabitants of the common dwelling can contract and then expand itself, and combine together to use their common pumps to draw in water into the tube, or else drive it out. They are said to possess a singular mode of defence. When

the fishermen take them up in their hands, probably somewhat roughly, they will frequently draw in the tube and thus thrust out the water so forcibly through the numerous small openings into the faces of their capturers as to blind them, and they, in their astonishment, drop the creatures from their hands."

The young Stanleys were highly amused at this stratagem. "We must not always judge, mother," said Edward, "of persons' sense by their looks. I am sure I should never have fancied, from the appearance of these good little people, that they could have so much cunning."

Mrs. Stanley now laid aside her papers, saying, "that she feared she had already detained them too long, but she hoped that the consideration of the works of God would dispose them to listen most attentively to his word."

CHAPTER VIII.

"Now the deep lets loose
Its blithe adventurers, to sport at large,
As kindly instinct taught them. So He ordained,
Whose way is in the sea, His path amidst great waters

"MAMMA," said Anna Stanley, "come with me, if you please, to that spot on the beach where Edward and Emma are standing, for we have found something to show you that we have never seen before, and that is very curious."

"Pray tell me, my dear," said her mother, "what it is you mean, for I am so comfortably fixed on this rock, that I do not particularly wish to move."

"Oh! mother! it is a sight well worth seeing, for there are a parcel of shells walking down to the water as nicely as we could, and yet they have no feet."

Her mother smiled, and permitted Anna to lead her away, saying as she did so, "I understand what you mean now, Anna; and I must tell you that conchologists have given the name of foot to that organ of

these inhabitants of the shell, by which they are enabled to move from place to place."

They soon approached the spot which Anna had pointed out, and beheld a number of shells, with the spiral part upwards, moving down to the water. Mrs. Stanley bade her children observe the motions of these animals. At each step they thrust out at the opening of the shells (which were of the stelia or snail family) a fleshy lip, as it were, and then drew it in again. When their mother took up one of them, the animal drew in its fleshy fringe, and the whole of the opening was entirely closed in an instant by a horny and partly transparent door. This fleshy organ, she told them, had been named a foot, because it performed, in some degree, the same offices to the shell, that the human foot does to the body to which it belongs. "Do you not recollect," she continued, "during one of our visits to old Robert, my showing you one of the Razor shells in his collection, and telling you in what manner it was said to

sink its shell in the wet sand, or raise it again when necessary?"*

"Oh yes, mamma," replied Emma, "I remember very well that you told us it formed its foot into the shape of a little trowel, and pushed it out at the bottom of the shell, where the two pieces of it gaped and lowered itself in that way. But I did not know then what sort of thing the foot of a shell was. Now that you have showed us one, I can understand it better."

"Is this horny thing which the animal draws in so closely, mamma," inquired Anna, "part of its foot? See, mother, how tight the little thing has fastened itself in; it will not let us see the least part of its flesh now."

"This horny substance, Anna," replied her mother, "is called the operculum, or mouth-piece of the shell, and varies in general appearance and in thickness very much in different shells. Many are transparent, horny, and very thin, like the one

* For this account, see "Wonders of the Deep."

we have been just examining; while others are more than half an inch thick, and resemble the texture of the other parts of the shell. Were this mouth-piece separated from the animal, you would perceive that a spiral line, similar to that on the shell, is marked both on the upper and lower surface. Some conchologists imagine that this mouth-piece is formed on the neck of the animal, which thus performs the part of a mould, and increases in size with the increasing size of the animal."

When the party reached home, they were eagerly intent upon showing their kind uncle the shell which they had brought from the beach, with its closed door. It was not however a new sight to him, for he had frequently seen such before, and he now brought the young people into his study, and showed them a number of shells of the same kind, varying in size from the diameter of half an inch to that of two or three inches; each had its own operculum, or mouth-piece, which fitted the opening exactly. Anna told her uncle how they

VIOLET SNAIL.

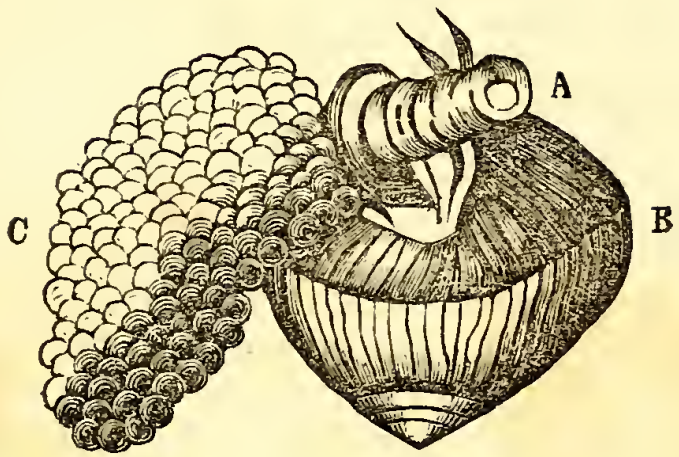


FIG. 1.

A. The Animal.
B. The shell.
C. The air bubbles used to propel it.

CHITON, OR COAT-OF-MAIL SHELL.

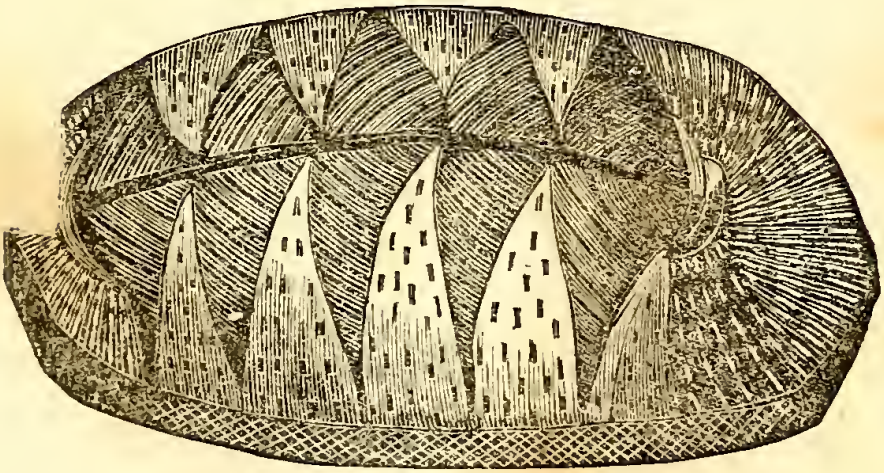


FIG. 2.

had seen the little creatures moving, and what her mamma had said of the wonders they were able to perform with their feet.

"I can tell you of something still more curious. What will you say when I tell you that the animals which inhabit shells not only know how to walk with their feet, but that some species are also so industrious as to sit within their shell houses and spin with their feet a kind of silk, which is afterwards manufactured into gloves and stockings?"

"Oh, uncle!" said Emma, with a smile; "we have heard of their making silk, though we did not know that they used their feet for that purpose."

"Well, I am sadly afraid that your mother has left me nothing to tell that will have the charm of novelty," said Mr. Benson. "Let me see, what can I find that is curious in my cabinet?" After looking for a while, he took up a very pretty purple shell, and asked them if they had ever heard of the violet snail?* When an an-

* For the original account, see Kirby's Bridgewater Treatise.

swer was given in the negative by all the young Stanleys, their uncle told them that he should then be able to find something to relate that would, he was certain, engage their attention. "This shell of mine," said Mr. Benson, "was brought from South America. When the sea, in certain places of that region, is quite calm, fleets of the violet snails, as I have read, may be seen floating over the surface, by means of a most singular contrivance, with which God has furnished them. Their foot is flat, and is provided with a transparent and most delicate set of little bags of different sizes; these little bags the animal can at pleasure fill with air by means of its foot. Look at this painting of the violet snail, with the animal which inhabits it, and its set of little bags as they appear when filled with air, (plate 7, fig. 1.) You will observe, if you examine the shell which I have just shown you, that it is remarkably thin and light, quite as much so as those of the Paper Nautilus. Doubtless they were both made so by their merciful Creator, in order that

their weight might not interfere with the movements of the animal when sailing. I must not forget to tell you how kindly the violet snail has been taught to avoid the dangers of a rough and stormy ocean. It has been furnished with the power on such occasions of drawing in the air from these little bladders, which then shrink into an excessively small compass, the skin being scarcely thicker than the covering of a soap bubble. After having forced out the air, it sinks itself into the ocean, and is thus safe from the threatening storm."

"Thank you, dear uncle," was echoed from the lips of Edward by his sisters, when Mr. Benson had ended his account of the violet snail.

He afterwards resumed the conversation in the following manner. "Both of the shells whose motions we have been considering belong to what conchologists term the univalves, or shells consisting of only one piece; would you like me to tell you of the movements of some of the bivalves,

or those which have two parts, like the clam or oyster ?"

Being urged to do so, Mr. Benson took out of his cabinet a common muscle shell, both sides of which were perfect, and the hinge which united them was there also. "This shell," he observed, "has no beauty to boast of, and yet from the contrivance exhibited in the formation of the animal which inhabits it, it is worthy of your attention. Mr. Smellie informs us, 'that it is provided with a fleshy organ of a red color, which projects from the lower part of the shell, which is its foot. When inclined to remove from its present situation, the river muscle opens its shell, thrusts out its foot, and while lying on its side in a horizontal position, digs a small furrow in the sand. Into this furrow, by the operation of the same foot, the animal makes the shell fall, and thus brings it into an upright position. We have now got our muscle on end; but how is he to proceed? He stretches forward his foot, by which he throws back the sand, lengthens the furrow, and this prop

enables him to proceed on his journey.' This account," said Mr. Benson, "I thought so well worth preserving that I copied it, as you observe, and keep the paper folded up under my muscle shell for the benefit of the visiters to my cabinet."

"Here is another shell, uncle," said Edward, "with a little piece of paper under it, that has some writing on; may I read it to my sisters?" His uncle gave him permission, and he proceeded to give the following extract from Mr. Smellie's work.

"The scallop has the power of progressive motion on land, as well as that of swimming on the surface of the water. When the animal happens to be deserted by the tide it opens its shell to its full extent, then shuts it with a sudden jerk, by which means it often rises five or six inches from the ground. In this manner it tumbles forward till it regains the water. When the sea is calm, troops or little fleets of scallops are often observed swimming on the surface. They raise one valve of their shell above the water, which becomes a kind of

sail, while the other remains under the water, and answers the purpose of an anchor, by steadying the animal and preventing its being overset. When an enemy approaches they instantly shut their shells, plunge to the bottom, and the whole fleet disappears. By what means they are enabled to regain the surface we are ignorant."

"I must tell you," said Mr. Benson, "that it was a shell of this latter kind which was worn in former times by Catholic pilgrims in their caps; so essential indeed was this ornament considered to their dress, that one of the most popular of our modern poets, when he wishes to describe the appearance of a pilgrim palmer, says, 'He wore St. James's cockle shell.'"

"Here, Edward, close by the scallop, you will find an English pecten; which two families of shells are closely allied. The latter was celebrated even among the old Roman writers for its movements. One of them says that the pecten can leap and flutter out of the water, and dive. Its mode of walking, or moving, is so similar to that of

the scallop, that it is needless for me to describe it particularly. Several other of the bivalved shells use their feet in moving themselves from place to place. But I have already told you of so many, that I am afraid you will be wearied with the subject. I will therefore give you permission to select for yourselves any specimen in my cabinet that strikes you as curious, and you may bring it to me for an explanation."

This was considered a great privilege, and the young people were soon intent on their search. Edward, after examining the different articles for a long time in silence, took up one, which riveted his attention from its being a novelty to him. It was about three inches in length, of a reddish brown color, and consisted of many small pieces fastened together by a gristly substance; the shape was oval, not unlike a baker's loaf, and, like that, rounded above; it was, however, entirely hollow. Edward carried it to his uncle, and begged to know its name, though he said he scarcely thought it could be a shell, as it was unlike any

thing of the kind he had ever before seen. (Plate 7, fig. 2.)

"Nevertheless, Edward," said his uncle, "this creature is ranked as a shell by conchologists, who give the genera to which it belongs the name of Chiton, or coat-of-mail shells, from the striking resemblance which they bear to the coats of armor in which the soldiers of olden times were accustomed to clothe themselves when going to battle. Chitons are generally found under stones, but often fasten themselves to rocks, or insert themselves into their cracks. Mr. Trembley, a gentleman who had great opportunities for studying the habits of those Chitons which inhabit the coast of Chili, says, 'that when not apprehensive of danger they attach themselves very slightly to the rocks, and that by pushing them gently, they easily slide from the surface to which they are attached; but if a direct attempt is made to unfix them by force, they will part with a portion of their shells sooner than let go their hold.' They also secure themselves strongly to the bottoms of vessels,

and in this situation, as well as in others, they are much exposed to the violence of the waves, and the attacks of formidable marine enemies: on these accounts most probably it was, that He who made all things, and remembers the peculiar necessities of each, furnished the Chitons with their coats-of-mail, by which they are protected in safety from all dangers."

When Mr. Benson had finished his account of the Chitons, his young relatives returned to the cabinet and laid the shell carefully in its proper place. Before many minutes had elapsed, Anna was arrested by a large genus, some of which she said she had often seen before, though she was ignorant of their names. There were many species, differing in color and marking, and also in their degrees of roughness, some being covered with ridges and little projections, while others were nearly smooth. In shape, however, there was a general resemblance among the species, and in this respect they varied from the rest of the collection. They were generally oval, but

all were uniformly formed of single pieces, and looked, Anna thought, a good deal like saucers turned upside down; the upper and round surfaces of these shells answering to the bottom of a saucer, were the parts which were colored and marked; the hollow parts were white, like the inside of other shells; and in the centre many of them had small holes, which looked as if they had been pierced. "Pray, dear uncle," said Anna, "be so kind as to tell me the name of this family of shells, and how the animals contrive to live in them."

"They all belong," he replied, "to the genus Patella, and are known commonly by the name of Limpets.* This family of creatures, like that of the Chitons, attach themselves to the rocks; their rounded and ornamented surfaces are placed upwards, and when one looks at a rock thickly peopled with them, he is reminded of a tented camp in miniature. The animals which inhabit these shells are secured by their

* Plate 8, fig. 1.

substantial tents from the violence of the waves above, and they are fastened firmly to the rocks beneath by means of numerous little threads, which answer the purpose of cables. Emma looks so knowing, that I think she must have some information to communicate. Pray tell me what it is, my little niece."

"Your account of the Limpets, dear uncle," she modestly replied, "makes me think of what the African servant says of them, in Mr. Richmond's pretty tract. Now that you have been so kind as to show us these Limpet shells, and tell us how they are fixed on the rocks, I can understand what poor William said better than I did before."

"I should like to hear what it was," said Mr. Benson, "for it is a long while since I read the tract of the African servant."

"If you will be so kind as to let me get the volume in which it is, I will read it to you, uncle," answered Emma.

"I would much prefer hearing it in your own language, Emma."

The little girl hesitated for some minutes, and then said, "Uncle, you remember one day Mr. Richmond went to see William, to talk with him, before he ventured to baptize him. Before he got to his master's house he saw William seated on the rocks by the sea-shore, reading his Bible. Mr. Richmond left his horse and sat down by him, and then this conversation about the Limpets took place. Poor William told Mr. Richmond what a sinful heart he had, and said nobody had such a naughty one. He said, 'Look at those Limpets, master, and see how fast they keep hold of the rocks; just so sin sticks fast to my heart.' Mr. Richmond bade him go, with all his sins, and take hold of the cross of the Lord Jesus Christ by faith in him; and then, he said, as the waves could not force the Limpets away from the stones on which they had fastened themselves, so neither should any thing separate him from the love of Jesus."

"Thank you, my dear Emma," said Mr. Benson; "I am pleased to find you remem-

ber the anecdote so well, for these simple illustrations of the truths of the gospel are very useful to us all, and I am grateful to the excellent Mr. Richmond for giving such a truly Christian lesson from the history of the humble Limpet. You have already been told of several kinds of shells, which have been taught by their divine Maker to secure themselves in an extraordinary manner, and I will show you another of somewhat similar habits." He then took up a large and beautiful shell, and asked Edward if he knew its name. "Yes, sir," replied Edward, "my mother has several of the same kind, though much smaller, which she calls ear-shells. She told me this name had been given to them because they were thought to resemble a human ear."

"As you have seen these shells before," said Mr. Benson, "you have no doubt observed the line of small holes which are uniformly found in them under the fold of the ear. Can either of you give me a rea-

son why you suppose they have been made?"

Neither Edward nor his sisters were able to offer one. Their uncle then laid one of these shells on the table, with the pierced side up, which he told them was their natural position, and bade them take notice that it did not lie so close to the table as the Limpets. "They, however, fasten themselves to the rocks," he said, "in the same manner as those shells do, and keep up a communication with the air, or water above them, entirely by means of these little holes." He then showed them one of the shells of the Haliotes, or Sea-ear family, which had upwards of a dozen of these apertures; more than half of which were, however, closed;* these were at the upper end of the shell, and were much smaller than the open ones. "They were made," observed Mr. Benson, "when the animal was young, and its habitation small; as they increased in age and size it stopped up its small windows, and made larger. You

* Plate 8, fig. 2.

PATELLA, OR LIMPET SHELL.

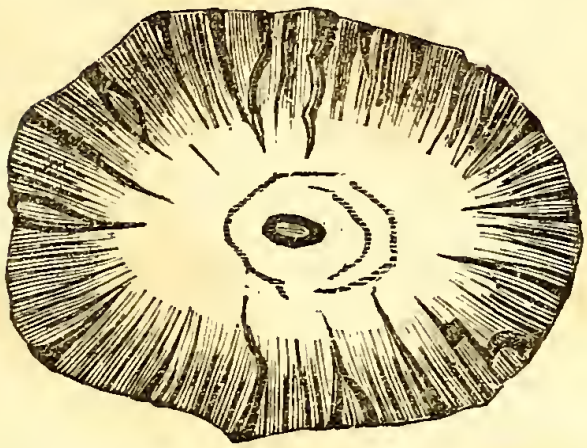


Fig. 1.

HALIOTIS, OR EAR SHELL.

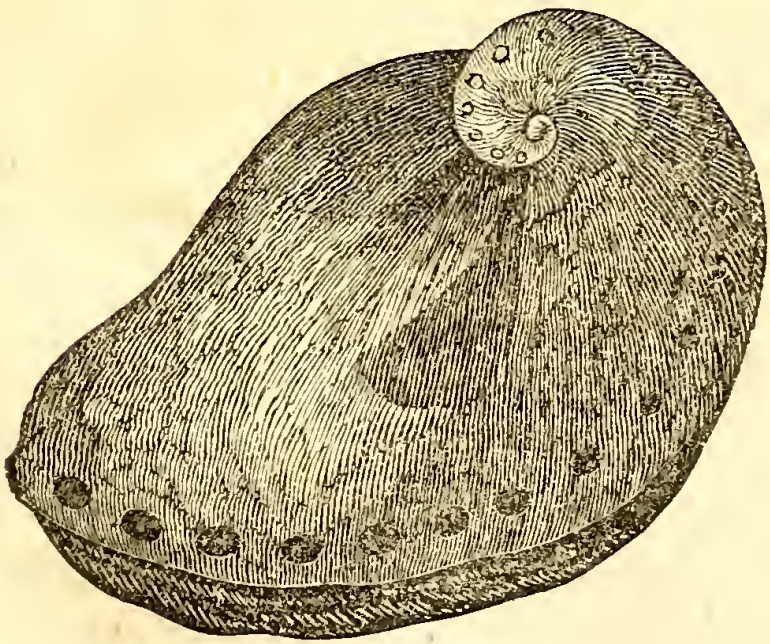


Fig. 2.

have now, I think, had quite enough matter for your young heads to digest on one day, and so I shall dismiss you from my study." So saying, Mr. Benson locked up his cabinet, and the young people took their leave of him for the present, after thanking him warmly for all the trouble he had taken for their gratification.

CHAPTER IX.

GEN. 1: 20. "And God said, Let the waters bring forth abundantly the moving creature that hath life." 21. "And God created great whales and every living creature that moveth, which the waters brought forth abundantly after their kind"—"and God saw that it was good."

A DAY or two after the visit of the young Stanleys to their uncle's study, which was recorded in the last chapter, while Mr. Benson was reading his newspapers there, he observed the heads of his nieces peeping in, as if to ascertain whether he was engaged. When they found that he was busy, they very properly withdrew in silence.

They were not, it must be confessed, very sorry to hear their uncle's voice recalling them, before they had gone far from his door, for these little girls dearly loved to be with their kind friend.

When they came in, they stood by his side in silence for a few minutes, as if they were a little unwilling to tell him what was their object in making the visit. Mr. Benson, too, said nothing for a while; but at last he gave one of his good-humored smiles, and drew them both towards him. After looking at them steadily, he asked if he should guess what they came for; they told him to do so, if he pleased.

"Well," said he, "I must try my powers of sifting matters. Let me see—Anna and Emma Stanley were so much pleased with the sight of their uncle's cabinet the other day, that they are greatly inclined to look at it again. Anna being the most timid, is afraid to make the request herself, and so Emma has come, supported by her sister to ask the favor. Edward, I suspect, thought it would look too childish for him

to be seen in front of the detachment; but if I am not mistaken; he is lying in ambush behind, ready to be summoned. Have I not stated matters pretty nearly right?"

The laugh of the little girls was echoed by a merry peal from the hall, and soon Edward appeared. "You have not guessed *exactly* what we came for, dear uncle," said Emma. "It was not so much to see your cabinet, as to ask you if you would be so kind as to tell us of some more of the curious anecdotes you know about shells and other creatures which are found in the sea."

"Ah!" said Mr. Benson, "it is a more serious favor then, you have to beg of me; but as I always like to gratify the rational desires of young people, when made known at proper times, and in a right manner, I will not deny you if you give me a little while to collect my materials. You may go and amuse yourselves, or employ yourselves this morning, and this afternoon, at four o'clock, you may return to my study."

Just as the hall clock struck the last note

of four, Mr. Benson heard a gentle tap at his door, and when he gave the summons to enter, Mrs. Stanley and her three children appeared. "I hope you will admit one more into your audience than you promised," said that lady, "for I always like to take every opportunity possible, of gaining information that may benefit my children."

"I certainly shall not do so rude a thing," replied her brother, "as to turn a lady out of my presence; more especially, as I think it very likely I shall have to call in her assistance. Among all the 'wonders of the deep,' which have been described since your visit, I have heard no notice taken of the various species of fish; and as some of them are in their habits very curious, and as all exhibit traces of His wisdom and love, who, when they were first created, pronounced them 'good,' I have determined to speak of this branch of the animal kingdom this afternoon, in preference to any other. Fishes are ranked with the other animals which possess a skeleton of bones, but they are

distinguished from them all by their mode of breathing. You are all aware that human creatures, birds, and beasts, are furnished by God with lungs, by which they draw in the air, and then expel it again: but as fishes were created to inhabit the water, their apparatus for breathing is very different: this consists of their gills, which are formed, to use Mr. Kirby's words, 'of long pointed plates disposed like the teeth of a comb, attached to bony or gristly bows; each of them covered by a tissue of innumerable blood vessels.' I will read you a short passage from the twenty-first chapter of Mr. Kirby's Treatise with reference to this subject, since I think his remarks are truly worth remembering by all of us. 'We know by experience,' he says, 'how soon an animal that breathes by lungs, if it remains only a few minutes under water, and is cut off from the atmosphere, is suffocated and dies; and that all aquatic animals that have not gills, or something like them, as all the water-beetles, &c. are obliged to seek the surface of the water for breath. Whence

we may learn what an admirable contrivance of divine wisdom is here presented to us, to enable the infinite host of fishes to breathe as easily in the water as we do in the air.' He afterwards tells us, that when we sum up the various characteristics by which this class of creatures we are now considering is distinguished from other branches of the animal world, 'we can trace at almost every step—so plainly, that almost *he that runs can read*—infinite power in the construction, infinite wisdom in the contrivance and adaptations, and infinite goodness in the end and object, of the peculiar modes by which they are enabled to live and move, and carry on the various animal functions. What else than such a God as the Bible represents, 'could have peopled the air and the waters with a set of beings so perfectly and beautifully contrasted with each other, as the fishes and the birds. Sprung originally from the same element, they each move, as it were, in an ocean of their own, and by the aid of similar, though not the same means. The

grosser element they inhabit, required a different set of organs to defend, to propel and guide, and to sink and elevate the *fish*, from what were requisite to effect the same purposes for the bird, which moves in a rarer, (that is, thinner, more delicate,) and purer medium.'—*Kirby*. As a specimen of the wisdom and love of God, displayed in suiting the bodies of fishes to the element in which they were intended to live, let me point out to your notice the peculiarities in their eyes. We all know that the sensation felt on opening our eyes in water, is very painful, and only overcome by long practice, but this organ in the head of the fish is formed like ours; how then is it enabled to move in water so pleasantly and readily? Kirby informs us, that 'the substance of which it is made makes the access of water no more troublesome to it, than that of the air to land animals.' The common eel, which was intended to live a great deal buried in the mud, was provided by the goodness of the Creator, with a transparent curtain which it can at pleasure draw over

its eye, to shield it from the mud. Another singular kind of eye is found in a fish which inhabits the rivers of Surinam, and is called by the natives the four-eyed fish: it is furnished with four pupils, and four of the iris: the iris is, you know, that part of the eye which is colored differently in various persons, some being blue, others black, hazel, or gray. Mr. Kirby conjectures that 'the object of divine wisdom in this extraordinary formation, may have been, to enable the animal to see near and distant objects at the same time—the little worms below it, that form its food, with one pupil and iris, and the great fishes above it or at a distance, which it may find it necessary to guard against, with the other.'"

"Is the eel the only kind of fish, uncle," inquired Edward, "that is furnished with a curtain to draw over its eyes?"

"It is certainly not the *only* one, Edward," replied Mr. Benson; "on the contrary, Dr. Good in his Book of Nature, tells us not only that the elephant, opossum, seal, cat-kind, and *all birds*, but that *all fishes*

are provided with what he calls a third eye-lid, by which they are enabled to cover their eyes with a thin transparent veil, either wholly or in part, and thus defend those organs from danger."

"I wish, brother," said Mrs. Stanley, "that you would be so kind as to tell my children something about the formation and use of the fins of fishes, as Edward has been making many inquiries on the subject."

"I will with pleasure," answered Mr. Benson, "for it is a point well deserving our consideration, and certainly one of the most essential and striking characteristics of fishes, from the little minnow, which a child may hold in the hollow of its hand, to the mammoth whale. Fins appear to have been given to these creatures, as far as we can ascertain, entirely as instruments of motion: they assume a variety of shapes and sizes, but could we examine each individual fish, we should see that the Almighty Creator has taken care that the fins of every one should be specially

adapted to its particular weight and motions. Mr. Kirby observes, 'Nothing is more graceful and elegant than the motions of fishes in their own pure element. Not to mention the shifting radiance of their forms as they glance in the sunbeams, their extreme flexibility, and the ease with which they glide through the waters, give to their motions a character of easy progress which has no parallel, unless, perhaps, in the varied flight of the wing-swift swallow among birds. How rapidly do they glide, and are lost to sight by a mere stroke of their tail! at another time, less alarmed, how quietly do they suspend themselves, and cease all progressive motion, so that we can discover them to be alive only by the fan-like motion of their pectoral fins,* an action which seems in some sort connected with their act of breathing; for they move them, as I have observed, more rapidly when in sultry weather they seek the surface.' I must try," resumed Mr. Benson, "to give you a

* Pectoral fins are those which are nearest the head, and close by the gills.

brief description of their fins: they are composed of a covering of skin which is generally supported by bony or gristly rays, like the strips of cedar in a paper or silk fan, and like that, they can open or shut, more or less. Fishes are usually provided with two pair of fins; those nearest the head answer the same purpose with the forelegs of other animals; the pair next the tail correspond with their hind legs: they have also, in many instances, a fin along the back; 'and the tail itself terminates in another, which is the most powerful of all.' This last they use not only as an instrument of motion, but as a rudder to guide them in their course. Some kinds of fish are said to possess the sense of hearing in an uncommon degree; and I recollect reading of some carp, or salmon, I do not remember which, that were kept in a pond by some English nobleman, which had been taught to rise regularly to the surface of the water for their dinner at the sound of a bell. Mr. Kirby quotes the naturalist Lacepede's assertion of some facts of this

kind, which, I must own, seem to me a little incredible: this gentleman not only declares, 'that in many parts of Germany fish of the trout, carp, and tench kinds, are summoned to their food by the sound of a bell,' but also, that 'some were kept in the basin of the Thuilleries for more than a century, that would come when *called by name.*'"

The young Stanleys were highly amused at this account, and seemed much amazed that any fish ever lived to be an hundred years old.

"If you think an hundred years so extraordinary an age for a fish to attain, my young friends," said Mr. Benson, "what will you say to the pike which was taken at Kaiserslauten, on the Rhine, 1754; which, from a ring fastened in its gill, was proved to have been put there in 1487, by the order of one of the emperors of Germany, and which was consequently upwards of 267 years old? This venerable patriarch measured 19 feet in length, and weighed 350 pounds."*

* Kirby's Bridgewater Treatise, p. 392.

"Oh, uncle!" said Edward, laughing, "that was certainly the Methuselah of fishes. No doubt such a venerable personage must have been wiser than any you have mentioned before. But, seriously, how can the age of a fish be known when it is without such a contrivance as the ring? I am sure I cannot think how it can be possibly told."

"Mr. Smellie informs us," said Mr. Benson, "that two methods have been devised for ascertaining the age of fishes. One is by examining their scales with a microscope, which will be found to consist of a number of circles, one within another, somewhat like the rings in the inside of the trunk of a tree; each one of these circles answers to a year in the life of the animal. The other mode is to cut the back bone of the fish across, and observe the number of rings in the surface of one of the joints, each of which is said in like manner to correspond with a year in the age of the fish to which it belonged. Before giving you any description of particular species of

fish, I cannot omit noticing one feature in their history, and that is the extensive journeys which many of them make at certain seasons of the year. This instinct fishes possess in common with many other animals, but in their case it is productive of peculiar benefit to man, and may indeed be ranked as a great blessing to our race."

"I do not understand, uncle," observed Edward, "what you mean when you say that that instinct of fishes which makes them travel in large bodies to distant places, is such a great advantage to mankind; except that at such times they afford abundant and cheap food to many poor people, as well as rich ones."

"Wait a little while, Edward," said his mother, "and do not be too forward in giving your opinion. I have no doubt that your uncle is amply provided with facts, by which he can support his assertion."

"I will only instance," observed Mr. Benson, "a few particulars connected with the history of the herring, and then Edward will be convinced that I have not spoken

hastily. This fish is said to be a native of the arctic or frozen seas of Europe, Asia, and America. When the ice begins to melt in those waters in the spring of the year, immense shoals of the herring, consisting of *many millions*, so closely compacted that the fish touch each other, set off on their journeys in search of food, and to deposite their eggs. Mr. Kirby tells us that 'these shoals are many fathoms in thickness; (a fathom is six feet.) The largest and strongest fish lead the shoals, which seem to move in a certain order, and to divide in bands as they proceed, visiting the shores of various islands and countries, and enriching their inhabitants. Their presence and progress are usually indicated by various sea-birds, sharks, and other enemies. One of the other species of fish, called the sea-ape, is said to accompany them, and is thence called the king of the herrings. They throw off also a kind of oily or slimy substance, which extends over their columns, and is easily seen in calm weather. This substance, in gloomy, still

nights, exhibits a phosphoric light, as if a cloth a little luminous was spread over the sea. Some conjecture may be formed of the *infinite numbers* of these invaluable fishes that are taken by European nations, from what Lacepede relates—that in Norway *twenty millions* have been taken at a single fishing; that there are few years that they do not capture four hundred millions, and that at Gottenburgh and its vicinity seven hundred millions are annually taken: but what are these millions, he remarks, to the incredible numbers that go to the share of the English, Dutch, and other European nations.'"—*Kirby*, B. T. p. 61.

"Dear uncle," said Edward, blushing as he spoke, "mother was indeed right; for I spoke very hastily, and I am afraid in too forward a manner. I am sorry that I interrupted you, and ventured to give my opinion on a subject, on which I find that I knew so little. I am astonished to hear that the herring abounds in such monstrous quantities."

"Your apology is accepted, my dear

boy," replied his uncle; "I have, however, some facts to state with respect to the herring fishery, which will still more strongly confirm my assertion, that the migration of fishes is a great blessing conferred by God on our race. 'Three thousand decked vessels of different sizes, besides smaller boats, are stated to be annually employed in the herring fishery, with a proportionable number of seamen, besides a vast number of hands, that, at certain seasons, are occupied in curing them.'—*Kirby.* Then, again, Edward, barrels and boxes are to be manufactured to pack them in; this gives employment to many coopers and other mechanics, so that not only do these fisheries furnish food for the numerous people who eat the fish, but they also provide work for a vast concourse of different kinds of honest tradesmen, and so become a blessing in various ways. I have mentioned the herring as being the most remarkable instance of migration, but there are various other kinds of fish which might be noticed, such as the cod, mackerel, haddock, salmon, &c. The

latter has been designated as 'the king of the river migrators.' It is, however, besides, frequent in almost every sea all over the globe, though it is said not yet to have been seen in the waters of the Mediterranean. 'It traverses the whole length of the largest rivers. It reaches Bohemia by the Elbe, Switzerland by the Rhine, and the Cordilleras of America by the mighty Maragnon, or river of Amazons, whose course is more than three thousand miles. In temperate climates the salmon quits the sea early in the spring, when the waves are driven by a strong wind against the river currents. It enters the rivers of France in the beginning of the autumn in September, and in Kamschatka and North America still later. In some countries this is called the salmon wind. They rush into rivers that are freest from ice, or where they are carried by the highest tide, favored by the wind; they prefer those streams that are the most shaded. They leave the sea in numerous bands, formed with great regularity. The largest individual, which is

usually a female, takes the lead, and is followed by others of the same sex, by two an two, each pair being at the distance of from three to six feet from the preceding one; next come the old, and after them, the young males in the same order. The noise they make in their transit, heard from a distance, sounds like a far-off storm. In the heat of the sun, and in tempests, they keep near the bottom; at other times they swim a little below the surface. In fair weather they move slowly, sporting as they go, at the surface, and wandering again and again from their direct route; but when alarmed, they dart forward with such rapidity that the eye can scarcely follow them. They employ only three months in ascending to the sources of the Maragnon, the current of which is remarkably rapid, which is at the rate of nearly forty miles a day; in a smooth stream or lake, their progress would increase in a fourfold degree. Their tail is a very powerful organ, and its muscles have a wonderful energy; by

placing it in their mouth* they make of it a very elastic spring, for, letting it go with violence, they raise themselves in the air to the height of from twelve to fifteen feet, and so clear the cataract that impedes their course; if they fail in their first attempt, they continue their efforts till they have accomplished it.'—*Kirby.* Hark!" said Mr. Benson, "there is the bell summoning us to tea; I must, of course, postpone what else I had to say until to-morrow."

* This idea of the salmon placing their tails in their mouths, Mr. Smellie expressly contradicts, and declares it a vulgar notion, and asserts that they spring straight up with a tremulous motion; the young reader must decide between Kirby's and Smellie's statements.

CHAPTER X.

"While the last bubble crowned the dimpling eddy,
Through which mine eye still giddily pursued it,
A joyous creature vaulted through the air,—
The aspiring fish that fain would be a bird,
On long light wings, that flung a diamond shower
Of dew-drops round his evanescent form,
Sprang into light,—and instantly descended."

MRS. STANLEY had, at the earnest request of her brother, prolonged her visit to Nahant much beyond the time she had anticipated when she first went there, until she found she could remain no longer; and on the morning succeeding the day we described in the last chapter, she informed him at the breakfast table that it would be absolutely necessary for her to leave him the day but one after, though she said she should do so with more regret than she had ever experienced before on such occasions. While she thanked him for all his kindness to her and to her children, and particularly for the trouble he had taken to instruct and amuse them, by describing the works of God to them, and leading them to

see His hand in their wonderful structure, the tears of grateful affection rolled down her cheeks. "I try, dear brother," she said, "to look beyond this short life to that world of blessedness and holiness, where I trust we shall spend an eternity together, in discoursing of God's great and glorious perfections, and in singing the great song, which ascribes glory, and honor, and power, to our blessed Redeemer forever and ever. While I think of that scene, I am in some measure reconciled to our painful separation here."

Mr. Benson became visibly affected also, and he dwelt on the pleasure he had derived from seeing his sister and her children at his house. He told her that her visit had given him quite a disgust, or rather distaste for his solitary habits of life; so much so, that he had been seriously considering, whether she and her children could not leave their old residence, and come to live with him. "You know Anna," said Mr. Benson, "that I have no wish to marry, and never have had, since

the object of my early affections was taken from me." He remained silent for a long time, and seemed absorbed in a train of painful recollections, as his memory reverted to those happy days of early manhood, when he was anticipating a union with one who was peculiarly calculated to throw a charm around domestic life. Disease fastened on his beloved Mary, and she was removed from him to another and better world; but he had loved too tenderly and too long to form a second attachment, and had gradually settled down as a confirmed old bachelor. His quiet habits of life for the last eight or nine years had made him indisposed to travel, and his sister and he had not met for that length of time. He had been greatly delighted at seeing her again, and had become so much attached to her children, that the thoughts of a separation from them, and a consequent return to a solitary parlor and a silent table, was very painful to him. He had been for some days seriously considering his project, until he thought he had met and answered

every objection on his own part; he now, therefore, waited somewhat anxiously to hear what his sister would say to the proposal. She told him, after due deliberation, that she felt no disinclination to the plan, and she was sure that her children would be as happy to remain with their dear uncle as she could be, but that she felt a good deal of delicacy in burdening him with so great an increase to his family. "But I tell you, Anna," he said playfully, "it will be real charity in you to come to me; I am beginning to feel the approach of age, and I often experience a sad want of a kind female friend to soothe and comfort me in sickness. Edward shall be my assistant in my counting-house, and my dear little girls, at home; your children shall have every advantage in their education, and from henceforth shall be considered as my own."

The mother's feelings were touched and comforted, for she was often tempted to be anxious about them, though she tried continually to commit them to Him, who has so tenderly encouraged the timid parent to

cast her fatherless children on Him for protection. She had, from motives of delicacy, not made her difficulties known to her brother, and he, from long absence, had ceased to think of them, as he once had done. A long conversation ensued, and the result was, that it was determined Mrs. Stanley should relinquish her humble country residence, which she had selected from motives of economy, and not from choice, and should come to preside over her brother's house. She was to leave him, as she first proposed, and go home for a few weeks to make her necessary arrangements; after that, she was to return and remain with Mr. Benson. The young Stanleys entered into their uncle's scheme with all the enthusiasm of youth, and were soon busy in laying their future little plans.

After dinner Mr. Benson summoned them to his study, telling them that as they were about to be separated for some weeks, they must come and have a little more conversation with him on the subject he had com menced on the afternoon previous, in order

that, by occupying his time, he might not have leisure to get melancholy at the thought of being alone again. "We have a good deal to talk of," he said, "and our time is limited, so that I shall only be able to make selections of certain kinds of fish to describe to you. Anna, my dear, you shall choose our first subject; what shall it be?" "It is hardly fair, dear uncle, to let the youngest have the first choice," she replied. "We are both willing that you should do so," said Edward and Emma at once, "for you are always so ready to give up to us."

Anna selected the flying-fish as that which she would most like to hear about.

"Ah!" said her uncle, "you want to have a description of that 'aspiring fish that fain would be a bird,' as Montgomery the poet calls him. To render my account the more interesting, I will show the wings of one of these pretty creatures, which I cut from a dead flying-fish, who destroyed himself by his adventurous flight into my vessel, during one of my voyages in the

Mediterranean." Mr. Benson took the wings to which he referred from his cabinet, and showed them to his nephew and nieces. The largest was about six inches in length; the rays were very small and delicate, and the texture of the wing resembled a sheet of thin transparent mica, or isinglass. "The fish," he said, "to which this belonged, flew with some others of the same kind into our vessel. They had probably been alarmed by the attack of some larger fish, for they came with great rapidity, and looked as if under the influence of terror. This poor thing in its haste ran its head against part of the vessel and killed itself. It was about a foot in length; the wings were the fins nearest the head, and were formed of this light transparent substance, in order, no doubt, that their weight might not interfere with the motions of the animal. We ate the flesh, and found it delicate and agreeable. Mr. Kirby is not quite willing that we should apply the term *flying*, to the motions of these pretty creatures in the air; he says the word is not a correct one, for

that these fish really do not use their fins to fly with, but as a support in the air, when they are driven from the sea by the attacks of their rapacious enemies. I have told you of a fish that flies, would you like to hear of some that can walk, and even climb trees?"

"Oh, uncle!" said Emma, "surely you are not in earnest!"

"Yes, I am, Emma," answered Mr. Benson, "really and truly in earnest, and I have the best authority for my assertion. Not to mention others, I will merely tell you that both Dr. Good and Mr. Kirby describe such animals of the fish kind. I will read you some extracts from the latter gentleman's work, which are as follows. 'Other fish, when reduced to extremity, desert their native pool, and travel in search of another that is better supplied with water. This has long been known of eels, which wind by night through the grass in search of water, when so circumstanced. Dr. Hancock, in the Zoological Journal, gives an account of a species of fish, called

by the Indians the flathead hassar, which is instructed by its Creator, when the pools in which they commonly reside, in very dry seasons lose their water, to take the resolution of marching by land in search of others which contain water. These fish grow to about the length of a foot, and travel in large droves with this view; they move by night, and their motion is said to be like that of the two-footed lizard. A strong serrated* arm forms the outer ray of the fin nearest the head. Using this as a kind of foot, it would seem, they push themselves forward by means of their elastic tail, moving nearly as fast as a man will walk leisurely. The strong plates which envelope their body make their progress more easy; in the same manner as those under the body of the serpent, which in some degree perform the office of feet. It is affirmed by the Indians that they are furnished with an internal supply of water sufficient for their journey, which seems

* *Serrated*—having an edge toothed like that of a common saw.

confirmed by the circumstance that their bodies when taken out of the water, even if wiped dry with a cloth, become instantly moist again. Mr. Campbell, a friend of Dr. Hancock's, resident in Essequibo, once fell in with a drove of these animals, which were so numerous that the Indians filled several baskets with them.' 'Another fish found by Daldorff in Tranquebar, not only creeps upon the shore, but even climbs the fan-palm in pursuit of certain crustaceans, which form its food. (This fish is called the perca scandens, or climbing perch.) Its structure peculiarly fits it for the exercise of this remarkable instinct. Its body is rendered slippery with slime, which renders its progress easier over the bark and among its chinks: its gill-covers are armed with numerous spines, by which, used as hands, it appears to suspend itself; turning its tail to the left, and standing as it were on the little spines of its lower fin, it endeavors to push itself upwards by the expansion of its body, closing at the same time its gill-covers, that they may not pre-

vent its progress; then expanding them again, it reaches a higher point: thus it continues its journey upwards. The fins can, if necessary, be folded up, and received into a cavity of its body. How exactly does this structure fit it for this extraordinary instinct! These fins assist it in certain parts of its route, and when not employed can be packed up, so as not to hinder its progress. The lobes of its gill-covers are so divided and armed as to be employed together or separately as hands, for the suspension of the animal, till by fixing its lower fins, it prepares itself to take another step; all showing the supreme intelligence and almighty hand that planned and fabricated its structure, causing so many organs, each in its own way, to assist in promoting a common purpose.'"—*Kirby.* When Mr. Benson had finished reading the above passages, he showed the young Stanleys an engraving in the same volume of a kind of fish called the callicthys, which Mr. Kirby assures his readers possesses the same powers of motion as the flathead hassar.

"There is another member of this family," said Mr. Benson, "called the hag-fish, which uses its moving powers in a rather extraordinary manner. It belongs to that class of fishes which Cuvier distinguishes by the general name of suckers. The celebrated Linnæus ranked it among worms, but Dr. Good tells us that it has been removed from that order with great propriety by modern naturalists, and placed among fishes. That gentleman gives us the following description of the hag-fish. 'It is a small lamprey-like animal of not more than eight inches long, and will convert a large vessel of water in a short period of time into a *size*, (or clear transparent glue,) of such a thickness, that it can be drawn out in threads. The form and habits of this little animal are singular. It is a cunning attendant upon the hooks of the fisherman; and as soon as it perceives a larger fish to be taken, and by its captivity rendered incapable of resistance, it darts into its mouth, preys voraciously, like the fabled vultures of Prometheus, on its inside, and

works its way out through the fish's skin.'"—Book of Nature, p. 115.

"Anna," said Mr. Benson, "you have had your turn in selecting a subject; Emma shall now choose what fishes there are, of which she would like to hear an account."

The little girl thought for some moments in silence; at length she replied, "I was going to say, uncle, that since you have been so kind as to let me name those that would interest me most, I should first say the whale: but I have heard a good deal about that already, and I believe it would be better for me to ask for some that I know less of; so, if you please, I will choose the shark and the sword-fish."

"Really, Emma," said her uncle, "your selection is somewhat odd, considering you are so peaceable a young lady. May I inquire why you are particularly interested in the history of the voracious and cruel shark?"

"The reason is, dear uncle, that I heard a gentleman say the other day, that he had very little doubt that it was one of these

fish, and not a whale, that swallowed Jonah; which surprised me, because I thought the shark was too small to swallow a man."

"I believe that opinion is becoming popular," said Mr. Benson; "and the fact that they are fully able to swallow as large a body as that of a human being, is, I think, established by no less an authority than Spallanzini. I remember well that he asserts several facts which are very striking on this point. When describing the dangers attendant on the shark fishery, he says, that somewhere about the time of his visit to Messina, one of the fishermen engaged in this occupation, was furiously attacked by a very large shark, who finally succeeded in biting off the poor man's leg, and that when his companions succeeded in killing the voracious creature, the limb of the sufferer was found entire in its stomach. He informs us that he was presented at Nice with the jaws of a shark, in whom after death the uninjured body of a child had been found. And he also declares that many witnesses attested to the

fact of an enormous shark having been taken near one of the maritime towns of Italy, in whose stomach were found two tunnies, and the body *of a man with his clothes untouched.* He accounts for their extraordinary capacities for swallowing, by mentioning the fact of their jawbones being elastic, from which circumstance they are able to open their mouths much wider than they could do otherwise. Dr. Good calls the shark, 'the most dreadful of all the monsters of the sea.' And says, 'the white shark often extends to thirty feet in length, and four thousand pounds in weight, follows ships with a view of devouring every thing that comes in his way, and has been occasionally known to swallow a man whole at a mouthful. But in order to guard us in some degree against the perils of their presence, a peculiar stream of light issues in the dark from their bodies, which cannot well be mistaken; and as some compensation for their rapacity, we obtain from their liver a large quantity of useful oil, and find in their skin a very valuable ma-

terial for carriage traces in some countries, and for polishing wood, ivory, and other hard substances in all countries.'—Page 185. When we first look at this family of voracious sea-monsters," continued Mr. Benson, "we may be tempted to ask why the merciful Creator has formed such beings, which are capable of inflicting so many tortures on man? But our perplexities are in a measure removed by the recollection that these accidents, awful as they undoubtedly are, happen but seldom: while the shark is daily performing a work which is highly serviceable to mankind; for he may be called the scavenger of the ocean, and removes all those offensive floating carcasses, which would otherwise greatly annoy, and perhaps seriously affect the health of many. If the vast families which people the mighty deep had been permitted to go on increasing without being destroyed by each other, the ocean would, as Mr. Kirby observes, have been in time filled with them, and its waters have overspread the land. And even, my dear children, if we are

wholly unable to account for God's dealings with us, or with the rest of the animal world, we ought to remember that these very mysteries may have been permitted to exist to exercise our faith. Our blessed Redeemer commended, in anticipation, those who should believe on Him, without seeing Him; and no doubt He will in like manner, reward with his approbation those who continue firmly to maintain an unshaken confidence in His love and mercy, though they know such facts exist as those we have alluded to, in the history of the shark, and other voracious animals, and which they cannot reconcile with their ideas of His love. With regard to the other fish you wished me to describe, Emma, I suppose it is scarcely necessary to state, that the sword-fish receives its name from the long appendage to its head, with which it has been furnished as an instrument for attacking its enemies. The largest species measures, I believe, from 15 to 20 feet. You have, I dare say, heard of a fragment of a vessel which is preserved in one of the museums

of London, containing the sword of one of these fish. This animal, it is said,* followed an East India vessel, and attacked it with such prodigious force that it thrust its sword entirely through the timber of the vessel, which would have been inevitably destroyed by the leak thus made, had not the animal been providentially killed by its own violence. The sword thus remained in the wood, and when the vessel reached England, the timber containing it was sawed out and taken to the British Museum, as a curiosity worth preserving."

When Edward's turn came, he requested his uncle to describe the curious eel, or fish, he did not know which it was, that had the power of giving an electric shock to those who handled it.

When Edward named his subject of inquiry, his uncle smiled, and observed, "I am bound to commend your choice, because it happens to be the same which I had made previously, and to describe which accurately, I have been consulting different

* Good's Book of Nature.

authors, and collecting all possible information within my reach. You said, Edward, that you were uncertain whether it was an eel, or another sort of fish, which possessed the extraordinary power of inflicting an electrical shock. This phenomenon is not, however, confined to one kind of fish, but is shared by five different genera; of these, two are particularly worthy of notice. The gymnotus electricus, or electric eel, belongs to one of these two, and the torpedo to another. I told you that I had consulted various authors, when preparing to give you information on this subject; not one of these, however, in fulness of description, or in interest, is at all to be compared with Mr. Kirby; and despairing of clothing his ideas in any language of my own selection, that could be at all equal in clearness to his, I have simply collected such of his observations as I thought would be most interesting, and copied them out for you, and have taken the liberty of substituting occasionally more simple words and expressions than those he makes use of,

because I thought that by so doing I should render the account more intelligible to your youthful minds. I will now give you my abridgment of Mr. Kirby's history of the electric fishes. 'Amongst all the diversified faculties, powers, and organs, with which supreme wisdom has gifted the members of the animal kingdom, as a means of defence from their enemies, or for securing for themselves a due supply of food, none are more remarkable than those by which they can give them an electric shock, and arrest them in their course, whether they are assailants or fugitives. That God should arm certain fishes in some sense with the lightning of the clouds, and enable them thus to employ an element so powerful and irresistible, in the same manner that we make use of gunpowder, to astound, and smite, and stupefy, and kill the inhabitants of the waters, is one of those wonders of an almighty arm which no inhabitant of the land is gifted to exhibit. For though some quadrupeds, as the cat, are known at certain times to collect the elec-

tric fluid in their fur, so as to give a slight shock to the hand that strokes them, it has never been clearly ascertained that they can employ it to arrest or bewilder their prey so as to prevent their escape. Even man himself, though he can charge his batteries with this element, and again discharge them, has not yet so subjected it to his dominion, as to use it independently of other substances, offensively and defensively, as the electric fishes do. The faculty of the torpedo to benumb its prey was known to the ancients, and one of them tells his readers, that, conscious of its power, it hides itself in the mud, and benumbs the unsuspecting fishes that swim over it. The Arabians observed this power, and gave the two genera of electric fishes known to them, the name raash, which signifies thunder. The electric organ in one of the four genera we have noticed, extends all round the animal immediately under the skin, and is formed of a coating of fibres interlaced together so as to make a network, the cells of which are filled with a jelly-

like matter. The torpedo is the most celebrated of all the electric fishes. In this the organ of its power extends on each side from the head and gills, to the lower part of the stomach, in which space it fills all the interior of the body. Each organ is attached to the parts that surround it by a thin skin, and by a number of fibres. Under the skin which covers the upper part of these organs, are two bands, one above, the other below; the upper one consisting of fibres running lengthwise, and the under one of others running crosswise. The latter continues itself in the organ by means of a great number of little tubes, which are hollow; some of them are six-sided, others five-sided, others four-sided: each of these little tubes is divided in the inside into a number of smaller parts, connected by blood-vessels. In each of the organs, which, as I have said previously, run down the two sides of the torpedo from the head to the lower part of the stomach, from two hundred to twelve hundred of these tubes have been counted, according to the different size

and age of the animal. The torpedo has all these numerous tubes, which may be compared to long rows of vials charged with electric matter, with which they make attacks. Almost always concealed in the mud, like most of the Rays, they can by these weapons kill the small fishes that come within the sphere of their action, or benumb the large ones; if they are in danger of attack from any voracious fish, they can disable him by invisible blows, more to be dreaded than are the teeth of the shark itself. The gymnotus, or electric eel, is a still more tremendous assailant, both of the inhabitants of its own element, and even of large quadrupeds, and of man himself, if he puts himself in its way. Its force is said to be ten times greater than that of the torpedo. This animal is a native of South America. In the immense plains of the Llanos in the province of Caraccas, is a city called Calaboza, in the neighborhood of which, these eels abound in small streams, insomuch that a road formerly much frequented, was abandoned on

account of them, it being necessary to cross a rivulet, in which many mules were lost annually by reason of their attacks. They are very common in ponds, from the equator to the ninth degree of north latitude. Contrary to what takes place in the torpedo, the electric organs of the gymnotus are placed under the tail, in a place removed from the vital ones. It has four of these organs, two large and two small, which occupy a third of the whole fish. These four are subdivided into many small parts, thirty-four having been counted in one of the large, and fourteen in one of the smaller organs. It is by this vast fourfold apparatus that the animal is able to inflict its violent shocks. Humboldt tells us that from placing his two feet on one of these fishes just taken out of the water, he received a shock more violent and alarming than any he ever experienced from the discharge of a large electric jar; and for the rest of the day he felt an acute pain in his knees and almost all his joints. Such a shock he thinks, if the animal passed over the breast

or stomach, might be mortal. It is stated that when the animal is touched with only one hand, the shock is very slight; but when two hands are applied at a sufficient distance, a shock is sometimes given so powerful as to affect the arms with a paralysis for many years. Humboldt gives a very spirited account of the manner of taking this animal, which is done by compelling twenty or thirty wild horses and mules to take the water. The Indians surround the basin into which they are driven, armed with long canes; some mount the trees whose branches hang over the water, all endeavoring by their cries and canes to keep the horses from escaping; for a long time the victory seems doubtful, or to incline to the fishes. The mules, disabled by the frequency and force of the shocks, disappear under the water; and some horses, in spite of the active vigilance of the Indians gain the banks, and overcome by fatigue, and benumbed by the shocks which they have received, stretch themselves at their length on the ground. There could

not, says Humboldt, be a finer subject for a painter; groups of Indians surrounding the basin; the horses, with their hair on end, and terror and agony in their eyes, endeavoring to escape the tempest that has overtaken them; the eels, yellowish and livid, looking like great aquatic serpents, swimming on the surface of the water in pursuit of the enemy. In a few minutes two horses were drowned; the eel, more than five feet long, gliding under the bodies of the animals, made a discharge of the electric matter on the whole extent, attacking at the moment the heart, and the other vital parts. The animals, stupified by these repeated shocks, fell into a profound stupor, and deprived of all sense, sank under the water, when the other horses and mules passing over their bodies they were soon drowned. The eels having thus discharged the quantity of the electric fluid collected in them, then became harmless, and were no longer objects of dread. Swimming half out of the water, they then flee from the horses instead of attacking them; and it

they enter the water the day after the battle they are not molested, for these fishes require repose and plenty of food to enable them to collect again a supply of electric matter. It is probable that they can act at a distance, and that they can inflict a shock through a thick mass of water. It is even asserted that they can do this when the object of their attack is removed from them so far as sixteen feet. There is another little fish of a very different tribe, which emulates the electric ones in bringing its prey within reach, by discharging a grosser element at them. It belongs to a genus, the different species of which are remarkable for the singularity of their forms, the brilliancy of their colors, and the vivacity of their movements. The species I allude to may be called the fly-shooter, from its food being principally flies and other insects, especially those that frequent aquatic plants and places. These, as Sir Charles Bell relates, *shoot* their prey, as it were, with a drop of water.' "—*Kirby.*

The little girls had entered so completely

into the spirit of the author's narrative, that by the time their uncle had concluded reading it, they had drawn their seats close to him, as if they too feared an attack from these concealed foes, and were desirous of ensuring his protection.

"Dear uncle," observed Emma, "I felt at first almost sorry when you told us that you intended to choose fishes for the subject that you were going to talk to us about, and I thought they were among the last things that I should have fixed on; but now I am very glad that you did not let me select for myself, for I am sure I could not have found any thing that interested me more, particularly the account of these electric fishes."

"It should convince you, Emma," replied Mr. Benson, "that all the 'works of the Lord are great,' and worthy of being searched into by all His people. 'All of them,' as Mr. Kirby justly observes, 'in their several stations, and by their several operations, glorify their almighty Author, by fulfilling His will. You have heard of

many 'wonders of the deep' this summer since your visit to Nahant, and you have mentioned many more that were related to you, during your former visit to the sea-shore, by your excellent mother and old Robert;* I trust that the impression thus made, will not readily be effaced, but on the contrary, may be the means of leading you still further in your researches into the temple of truth, the two doors of entrance into which, have been said to lie, one in the works of God, and the other in His word."

When the hour came which was to be the signal of the departure of the Stanley family from the roof of the hospitable Mr. Benson, it found them all reconciled to their separation, from the thoughts of its being so short a time before they would re-assemble again in Boston to constitute a united family. Agreeably to this plan, when December arrived they were comfortably fixed in their new residence. The day was spent by Edward in his uncle's counting-house, and by the little girls in the school-

* For the account of these, see "Wonders of the Deep."

room with their excellent mother ; but when night closed in, the happy family assembled in Mr. Benson's comfortable parlor, and the hours rolled by rapidly, while the females of the party were engaged with their needle, and while Mr. Benson and Edward alternately read to them some agreeable or instructive book.

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